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检测  
TESTING  
CNAS L0446

GRGTEST

Page 1 of 64

# Test Report

Verified code: 677485

Report No.: E20230711057201-6

Customer: Lumi United Technology Co., Ltd

Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

Sample Name: Camera E1

Sample Model: CH-C01E

Receive Sample Date: Jul.12,2023

Test Date: Jul.17,2023 ~ Aug.02,2023

ETSI EN 301 489-1 V2.2.3 (2019-11)

ETSI EN 301 489-17 V3.2.4 (2020-09)

Reference Document: EN 55032:2015/A11:2020

EN 55035:2017/A11:2020

EN IEC 61000-3-2:2019/A1:2021

EN 61000-3-3:2013/A2:2021

Test Result: Pass

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GRG METROLOGY & TEST GROUP CO., LTD.

Issued Date: 2023-09-04

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**REPORT ISSUED HISTORY**

Report Version	Report No.	Description	Compile Date
1.0	E20230711057201-6	Original Issue	2023-08-07

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## 1. TEST RESULT SUMMARY

### Emissions

Test Item	Test mode	Equipment test requirement	Test Method	Test Specification Level	Test Result
Radiated Emission	Mode 1	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 55032:2015	Meet Standards Class B Limits	PASS
Radiated Emission	Mode 1	EN 55032:2015/A11:2020	EN 55032:2015/A11:2020 Table A.4 and A.5	Table A.4 Class B Table A.5 Class B	PASS
Conduction Emission	Mode 1	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 55032:2015	Table A.10 Class B	PASS
Conducted Emission	Mode 1	EN 55032:2015/A11:2020	EN 55032:2015/A11:2020 annex A.3	Table A.10 Class B	PASS
Asymmetric mode conducted emissions	/	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 55032:2015 annex A.3	Table A.12 Class B	Note <sup>1)</sup>
Asymmetric mode conducted emissions	/	EN 55032:2015/A11:2020	EN 55032:2015/A11:2020 annex A.3	Table A.12 Class B	Note <sup>1)</sup>
Harmonic current	Mode 1	ETSI EN 301 489-1 V2.2.3 (2019-11)/8.5 ETSI EN 301 489-17 V3.2.4 (2020-09)/7.1.1	EN 61000-3-2:2014	Class A	Note <sup>2)</sup>
Harmonic current	Mode 1	EN IEC 61000-3-2:2019/A1:2021	EN IEC 61000-3-2:2019/A1:2021	Class A	Note <sup>2)</sup>
Voltage fluctuations and flicker	Mode 1	ETSI EN 301 489-1 V2.2.3 (2019-11)/8.6ETSI EN 301 489-17 V3.2.4 (2020-09)/7.1.1	EN 61000-3-3:2013	Meet Standards Limits For Pst, Tp = 10 min	PASS
Voltage fluctuations and flicker	Mode 1	EN 61000-3-3:2013/A2:2021	EN 61000-3-3:2013/A2:2021	Meet Standards Limits For Pst, Tp = 10 min	PASS

**Immunity**

<b>Test Item</b>	<b>Test mode</b>	<b>Equipment test requirement</b>	<b>Test Method</b>	<b>Test Specification Level</b>	<b>Test Result</b>
Electrostatic discharge (ESD)	Mode 1	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 61000-4-2:2009	Test specification: ±2kV, ±4kV, ±8kV Air discharge ±4kV Contact discharge Performance : Criteria B	PASS
		EN 55035:2017/A11:2020	IEC 61000-4-2:2008		
RF electromagnetic field (RS)	Mode 1	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 61000-4-3:2006+A1:2008+A2:2010	Test specification: Test level: For the frequency range 80MHz to 6000MHz, test level shall be 3V/m, 80% AM(1kHz) Performance: Criteria A	PASS
		EN 55035:2017/A11:2020	IEC 61000-4-3:2006+A1:2007+A2:2010	Test specification: For the frequency range 80MHz to 1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz test level shall be 3 V/m, 80% AM(1kHz) Performance: Criteria A	
Electrical fast transients(EFT)	Mode 1	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09) EN 55035:2017/A11:2020	EN 61000-4-4:2012	Test specification: AC power port: ±1kV, repetition rate: 5 kHz Performance: Criteria B	PASS
Surges	Mode 1	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 61000-4-5:2014+A1:2017	Test specification: AC power port: 1.2/50 us pulse line to line: ±0.5 kV, ±1 kV; Performance : Criteria B	PASS
Surges	Mode 1	EN 55035:2017/A11:2020	IEC 61000-4-5:2005	Test specification: AC power port: 1.2/50 us pulse line to line: ±0.5 kV, ±1 kV; Performance : Criteria B	PASS
Radio frequency continuous conducted(CS)	Mode 1	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 61000-4-6:2014	Test specification: AC power port 0.15~80 MHz, 3Vrms, 80% AM, 1kHz Performance: Criteria A	PASS

Radio frequency continuous conducted(CS)	Mode 1	EN 55035:2017/A11:2020	IEC 61000-4-6:2008	AC Input Power: 0.15MHz-10MHz 3V 10MHz-30MHz 3 to 1V 30MHz-80MHz 1V 80% AM(1kHz) Performance: Criteria A	PASS
Power frequency magnetic field	Mode 1	EN 55035:2017/A11:2020	IEC 61000-4-8:2009	1A/m 50Hz and 60Hz Performance Criterion A	PASS
Voltage Dips & Short Interruptions	Mode 1	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 61000-4-11:2004	Test specification: 1. Voltage dips: i) 0% residual voltage 0.5 cycle. Performance: Criteria B; ii) 0% residual voltage 1 cycle, Performance: Criteria B; iii) 70% residual voltage 25 cycle. Performance: Criteria C; 2. Voltage interruption: 0% residual voltage during 250 cycles. Performance: Criteria C	PASS
Voltage Dips & Short Interruptions	Mode 1	EN 55035:2017/A11:2020	IEC 61000-4-11:2004	Test specification: 1. Voltage dips: i) 0% residual voltage 0.5 cycle. Performance: Criteria B ii) 70% residual voltage 25 cycle for 50Hz Performance: Criteria C 2. Voltage interruption: 0% residual voltage during 250 cycles for 50Hz. Performance: Criteria C	PASS

Note1:

<sup>1)</sup>: Not applicable, since the EUT no telecommunication port.<sup>2)</sup>: Not applicable, since The EUT with a rated power of less 75 W.

## 2. GENERAL DESCRIPTION OF EUT

### 2.1 APPLICANT

Name: Lumi United Technology Co., Ltd

Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

### 2.2 MANUFACTURER

Name: Lumi United Technology Co., Ltd

Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

### 2.3 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Product Name: Camera E1

Product Model: CH-C01E

Adding Model: /

Model difference  
description: /

Trade Name: Aqara

Power supply: DC 5V,2A

Frequency Band: 2412MHz - 2472MHz for 802.11b/g/n HT20/ ax HE20

2422MHz - 2462MHz for IEEE 802.11n HT40/ax HE40

Bluetooth LE with 1M&2M: GFSK

Sample submitting  
way: ■Provided by customer    □Sampling

Sample No: E20230711057201-0007

Note: We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions.

## 2.4 TEST MODE

Mode No.	Description of the mode
Mode 1	The EUT power supply by adapter. Under the same external network(2.4G wifi), open the bluetooth of the mobile phone, then through the mobile phone APP scan the QR code of EUT, send the 2.4G wifi ssid and password to EUT, and it is connected to the mobile phone. The mobile phone can take a conversation with the EUT and monitor the video from the EUT. The videos of the EUT are stored to the TF card at real time. Monitoring the bluetooth (BLE) through the spectrum, it will broadcast in real time.

## 2.5 EUT OPERATING DESCRIPTIONS

No.	Operating description
a)	Full system

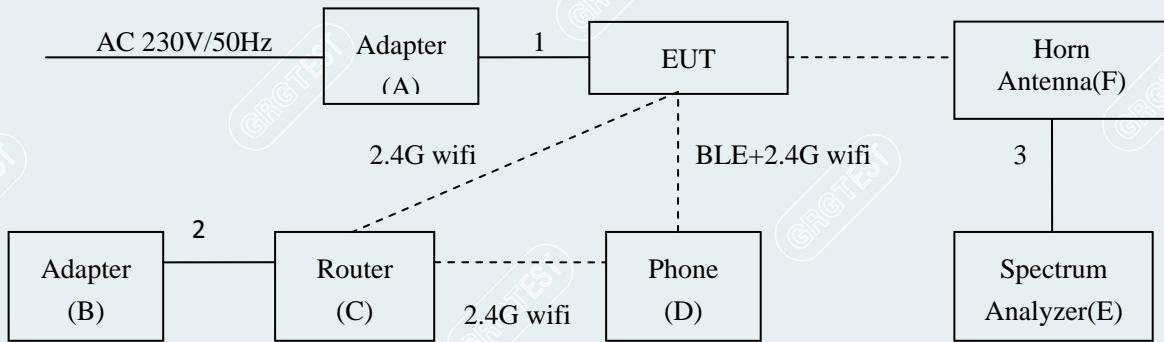
## 2.6 LOCAL SUPPORTIVE INSTRUMENTS

No.	Name of Equipment	Manufacturer	Model	Serial Number
A	Adapter	Aohai	A70-050200U-EU1	/
B	Adapter	TP-LINK	T050060-2A1	/
C	Router	TP-LINK	TL-WR840N	/
D	Phone	OPPO	R11S	/
E	Spectrum Analyzer	R&S	FSV30	104381-rH
F	Horn Antenna	TRC	HA0301	100204

No.	Cable Type	Qty.	Shielded Type	Ferrite Core(Qty.)	Length
1	USB to type-C cable	1	No	0	1.00m
2	DC cable	1	No	0	1.00m
3	RF cable	1	No	0	3.00m

## 2.7 CONFIGURATION OF SYSTEM UNDER TEST

Mode 1:



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### 3. LABORATORY AND ACCREDITATIONS

#### 3.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

Add : No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District  
Shenzhen, 518110, People's Republic of China  
P.C. : 518110  
Tel : 0755-61180008  
Fax : 0755-61180008

#### 3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

China	CNAS(L0446)
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Copies of granted accreditation certificates are available for downloading from our web site,  
<http://www.grgtest.com>

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#### 4. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conduction Emission	150kHz~30MHz	3.3dB <sup>1)</sup>
Radiated Emission	30MHz~200MHz(H)	4.5dB <sup>1)</sup>
	200MHz~1000MHz(H)	4.4dB <sup>1)</sup>
	30MHz~200MHz(V)	4.4dB <sup>1)</sup>
	200MHz~1000MHz(V)	4.5dB <sup>1)</sup>
	1GHz~6GHz(H)	5.0dB <sup>1)</sup>
	1GHz~6GHz(V)	5.1dB <sup>1)</sup>
	/	2)
Harmonic Current	/	2)
Voltage Fluctuation and Flicks	/	2)
Electrostatic discharge	/	2)
Radio-Frequency Electromagnetic Field	/	2)
Electrical Fast Transient/Burst	/	2)
Surge	/	2)
Conducted radio frequency disturbances	/	2)
Power frequency magnetic field	/	2)
Voltage Dip & Voltage Interruptions	/	2)

<sup>1)</sup> This uncertainty represents an expanded uncertainty expressed at approximately the 95%.

This uncertainty represents an expanded uncertainty factor of  $k=2$ .

<sup>2)</sup> Tests have proved that, test system meet the requirements of the standard with a confidence level of not less than 95%.

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## 5. LIST OF USED TEST EQUIPMENT AT GRGT

### 5.1 LIST OF USED TEST EQUIPMENT

Name of equipment	Manufacturer	Model	Serial number	Calibration due
<b>Radiated Emission (Below 1GHz)</b>				
Test S/W	Tonscend	JS32-RE	/	/
Test Receiver	R&S	ESR26	101758	2023-10-27
Preamplifier	SHIRONG ELECTRONIC	DLNA-30M1G-G41	20200928002	2023-08-19
Bi-log Antenna	Schwarzbeck	VULB 9160	VULB9160-3402	2023-10-23
<b>Radiated Emission (Above 1GHz)</b>				
Test software	Tonscend	JS32-RE	/	/
Test Receiver	R&S	ESR26	101758	2023-10-27
Preamplifier	Tonscend	TAP01018048	AP20E8060075	2024-04-11
Preamplifier	SHIRONG ELECTRONIC	DLNA-1G18G-G40	20200928005	2023-08-27
Horn antenna	Schwarzbeck	BBHA 9120D	02143	2023-10-15
<b>Conduction Emission</b>				
Test software	EZ	CCS-3A1-CE	/	/
Test Receiver	R&S	ESCI	100783	2023-08-28
LISN(EUT)	R&S	ENV216	101543	2023-09-13
<b>Harmonic Current</b>				
Test S/W	/	CTS4	/	/
Power Source	SCHAFFNER	NSG1007	54789	2024-02-09
Harmonic & Flicker Tester	SCHAFFNER	CCN1000	72045	2023-08-28
<b>Voltage Fluctuation and Flicks</b>				
Test S/W	/	CTS4	/	/
Power Source	SCHAFFNER	NSG1007	54789	2024-02-09
Harmonic & Flicker Tester	SCHAFFNER	CCN1000	72045	2023-08-28
<b>Electrostatic discharge</b>				
Dito ESD Simulator	EM Test	dito	V0809103493	2023-10-21

<b>Radio-Frequency Electromagnetic Field</b>				
Test S/W	Tonscend	JS35-RS	/	/
Signal generator	R&S	SMA100A	100434	2023-08-19
Switch	TOYO	BS5000	/	/
Power Meter	Keysight	N1914A	MY57090009	2023-09-29
Power Probe	Keysight	E9301A	MY57060008	2023-08-19
Power Probe	Keysight	E9301A	MY56520006	2023-08-19
Log-periodic broadband antenna	Schaffner	CBL6143	5082	2023-12-17
Dual directional Coupler	AR	DC 6180A	0328212	2023-09-07
Power Amplifier	SCHAFFNER	CBA9433	3007	2024-04-27
Microwave Log.-Per. Antenna	Schwarzbeck	STLP9149	9149-163	2023-09-11
Power Amplifier	Milmega	AS1860-50	1079232	2024-03-02
Power Amplifier	TESEQ	CBA 3G-050	T44161	2024-03-02
Dual directional Coupler	AR	DC 7144A	327057	2023-09-07
<b>Electrical fast transient/burst</b>				
EFT/Surge generator	3Ctest	CCS 1000	ES014001420001	2023-08-10
Coupled decoupling network	3Ctest	SEPN 1000T	ES066000920001	2023-08-28
<b>Surge</b>				
EFT/Surge generator	3Ctest	CCS 1000	ES014001420001	2023-08-10
Coupled decoupling network	3Ctest	SEPN 1000T	ES066000920001	2023-08-28
<b>Conducted radio frequency disturbances</b>				
Test S/W	Tonscend	JS35-CS	/	/
Signal Generator	TESEQ	NSG4070	25807	2024-03-02
Attenuator	weinschel corp	40-6-34	QQ986	2023-08-19
CDN	Luthi	CDN801-M2	1897	2023-08-28
<b>Power frequency magnetic field</b>				
Test S/W	TESEQ	Win2120 Ver6.00	/	/
Power Source	SCHAFFNER	NSG1007	54789	2024-02-09
Signal generator	SCHAFFNER	INA2141	6003	2023-08-28
Induction coil Interface	SCHAFFNER	INA-702	711-1115	2023-08-28

<b>Voltage Dip &amp; Voltage Interruptions</b>				
Test S/W	AMETEK	AC Source CIGuiSII-500lix	2.0.0.7-No v.2006	/
Power Source	SCHAFFNER	NSG1007	54789	2024-02-09
AC Switching Unit	TESEQ	NSG2200-1	A17820	2023-09-07

Note: The calibration interval of the test instruments is 12 months.

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## 6. EMISSION TEST

### 6.1 RADIATED EMISSION MEASUREMENT (RE)

Test Requirement: EN 301 489-1  
EN 301 489-17  
EN 55032

Test Method: EN 55032

#### 6.1.1 LIMITS

The ancillary equipment shall meet the class B limits given in CENELEC EN 55032 [1], annex A tables A.4 and A.5.

**Table A.4 – Requirements for radiated emissions at frequencies up to 1 GHz for class B equipment**

Frequency range(MHz)	Distance (m)	Bandwidth	Limits (dBuV/m)		
			Peak (PK)	Quasi-peak (QP)	Average (Avg)
30~230	3	120kHz	/	40	/
230~1000	3	120kHz	/	47	/

**Table A.5 – Requirements for radiated emissions at frequencies above 1 GHz for class B equipment**

Frequency range(MHz)	Distance (m)	Bandwidth	Limits (dBuV/m)		
			Peak (PK)	Quasi-peak (QP)	Average (Avg)
1000~3000	3	1MHz	70	/	50
3000~6000	3	1MHz	74	/	54

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## 6.1.2 TEST PROCEDURE

### (1) Procedure of Preliminary Test

Radiated emission tests shall be made with the receive or transmit antenna located at a horizontal distance of 3m or 10m plus half of the maximum width of the EUT being tested, measured from the centre of the EUT. The tests shall be performed with the equipment configured as closely as possible to its typical, practical operation. Unless stated otherwise, cables and wiring shall be as specified by the manufacturer and the equipment shall be in its housing (or cabinet) with all covers and access panels in place. Any deviation from normal EUT operating conditions shall be included in the test report.

The EUT (on a non-conductive support structure, where applicable) shall be placed on a remotely operated turntable, to allow the EUT to be rotated. The height of the EUT above the ground plane shall be according to the following requirements.

-- Table-top equipment is placed on a non-conductive set-up table with height  $0.8\text{ m} \pm 0.01\text{ m}$ , CISPR 16-1-4 specifies the method to determine the impact of the non-conductive set-up table on test results.

-- Floor-standing equipment is placed on a non-conductive support, as specified in the applicable product standard. If there are no EUT height placement requirements in the product standard, the EUT shall be placed on a non-conductive support at a height of 5 cm to 15 cm above the ground plane.

Note: This is table-top equipment.

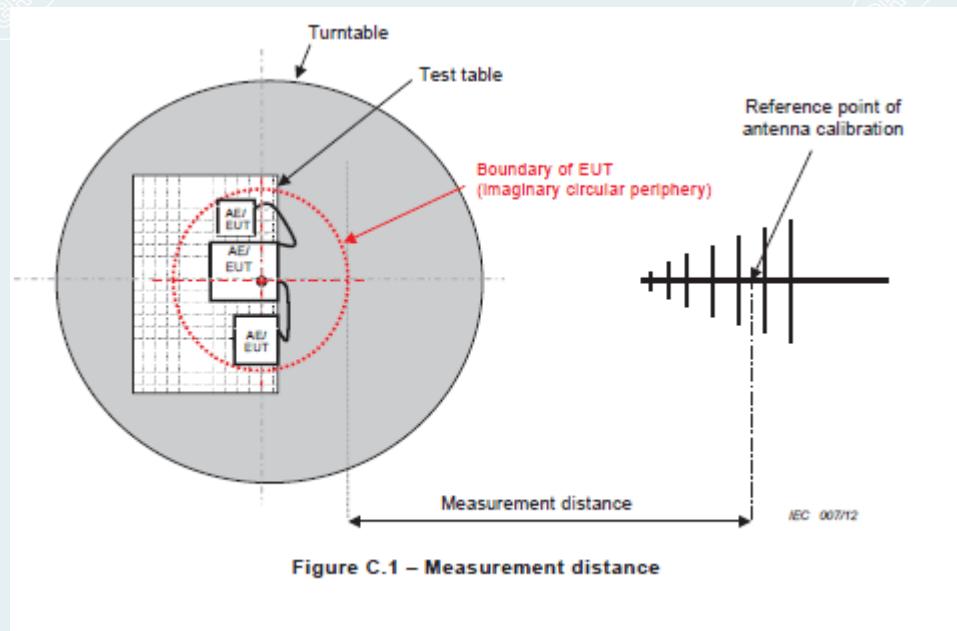
Interface cables, loads, and devices should be connected to at least one of each type of the interface ports of the EUT and, where practical, each cable shall be terminated in a device typical for its actual use. Where there are multiple interface ports of the same type, a typical number of these devices shall be connected to devices or loads. It is sufficient to connect only one of the loads, provided that it can be shown, for example by preliminary testing, that the connection of further ports would not significantly increase the level of disturbance (that is, more than 2 dB) or significantly degrade the immunity level.

The test mode(s) were scanned during the preliminary test. After the preliminary scan, we found the test mode producing the highest emission level. The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

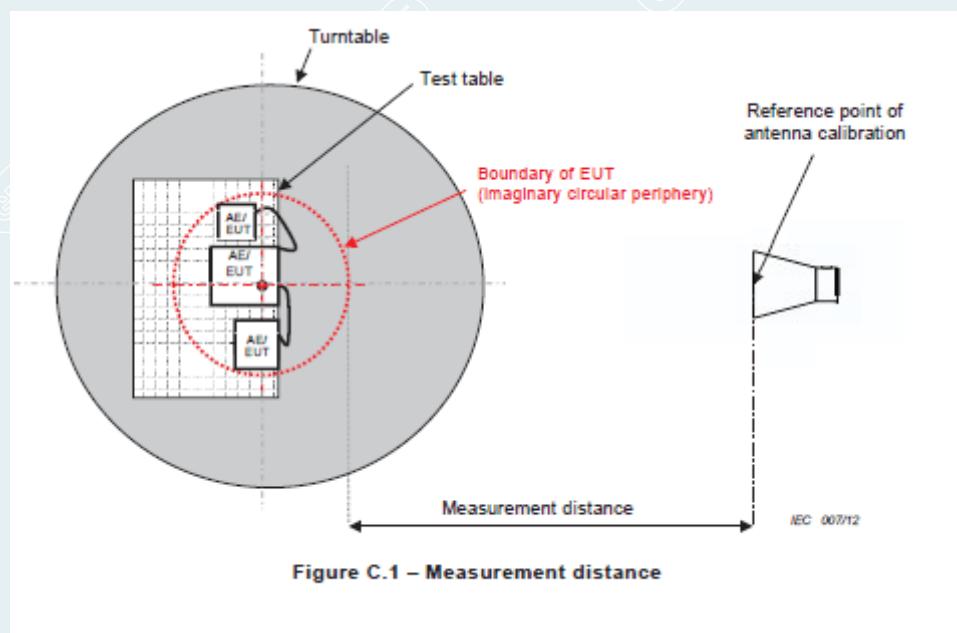
### (2) Procedure of Final Test

EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test. The Analyzer/ Receiver scanned from 30MHz to 1000MHz and 1000MHz to 6000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level. Record at least six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and for 30MHz~1000MHz only QP reading is presented, for 1000MHz~6000 MHz Peak and AVG reading is presented.

### 6.1.3 TEST SETUP



Below the frequency of 1GHz



Above the frequency of 1GHz(1GHz-6GHz)

### 6.1.4 DATA SAMPLE

#### Below 1GHz

Suspected Data List										
NO.	Freq. [MHz]	Reading [dB $\mu$ V/m]	Level [dB $\mu$ V/m]	Factor [dB]	Limit [dB $\mu$ V/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
xxxx	xxxx	62.87	34.23	-28.64	40.00	5.77	PK	200	351	Horizontal

#### Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Reading [dB $\mu$ V/m]	Level [dB $\mu$ V/m]	QP Limit [dB $\mu$ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
xxxx	xxxx	-28.64	54.02	25.38	40.00	14.62	100	196	Horizontal

Frequency (MHz)

= Emission frequency in MHz

Reading (dB $\mu$ V/m)

= Uncorrected Analyzer / Receiver reading

Level (dB $\mu$ V/m)= Reading (dB $\mu$ V/m) + Factor (dB)Limit (dB $\mu$ V/m)

= Limit stated in standard

Margin (dB)

= Limit(dB $\mu$ V/m) - Level(dB $\mu$ V/m)

Peak

= Peak Reading

QP

= Quasi-peak Reading

#### 1GHz-6GHz

No.	Freq. [MHz]	Reading [dB $\mu$ V/m]	Level [dB $\mu$ V/m]	Factor [dB]	Limit [dB $\mu$ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
xxx	xxxx	78.01	55.30	-22.71	74.00	18.70	100	50	Horizontal	Peak
xxx	xxxx	66.37	43.66	-22.71	54.00	10.34	100	50	Horizontal	AVG

Frequency (MHz)

= Emission frequency in MHz

Reading (dB $\mu$ V/m)

= Uncorrected Analyzer / Receiver reading

Level (dB $\mu$ V/m)= Reading (dB $\mu$ V/m) + Factor (dB)Limit (dB $\mu$ V/m)

= Limit stated in standard

Margin (dB)

= Limit(dB $\mu$ V/m) - Level(dB $\mu$ V/m)

Peak

= Peak Reading

AVG

= Average Reading

### 6.1.5 PHOTOGRAPH OF THE TEST ARRANGEMENT

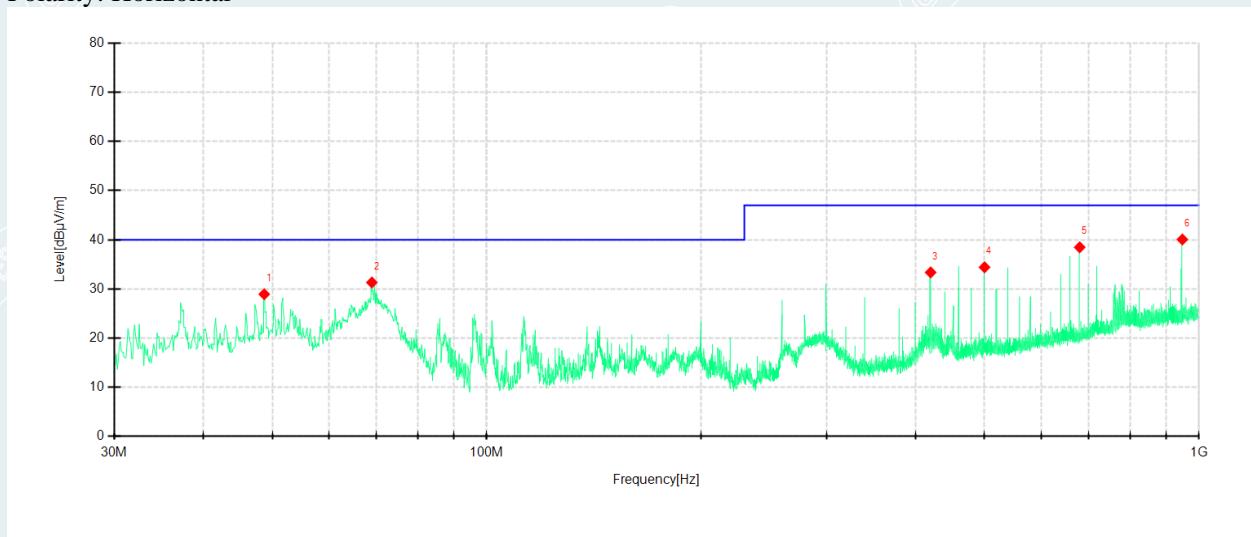
Please refer to the attached document E20230711057201-7 Test photo

## 6.1.6 TEST RESULTS

Below 1GHz

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	26.5°C/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Huang Xinlong
Test Date	2023-07-25	Sample No.	E20230711057201-0007

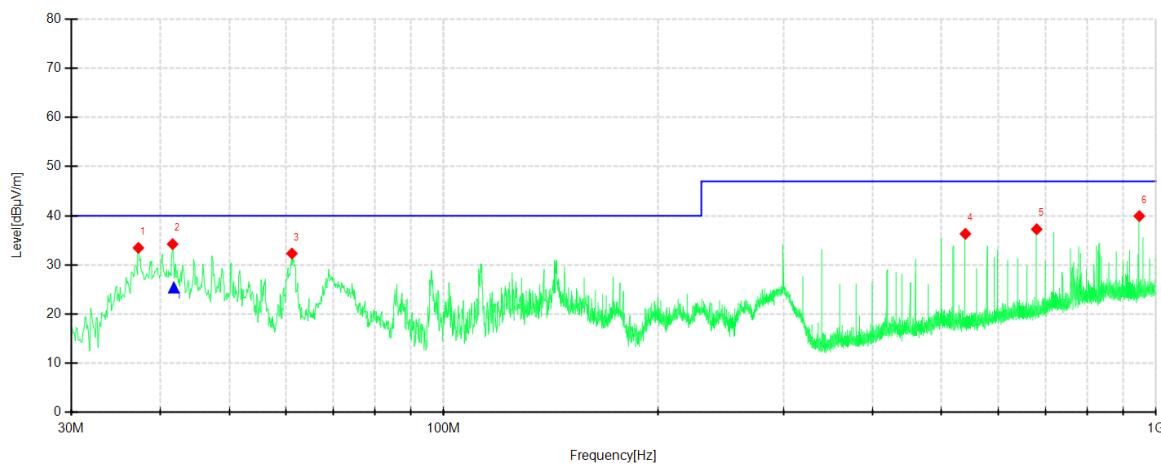
Polarity: Horizontal



Suspected Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	48.7210	57.47	28.93	-28.54	40.00	11.07	PK	200	322	Horizontal
2	68.9940	62.04	31.32	-30.72	40.00	8.68	PK	200	303	Horizontal
3	420.0370	56.93	33.36	-23.57	47.00	13.64	PK	100	139	Horizontal
4	499.9650	55.85	34.41	-21.44	47.00	12.59	PK	100	139	Horizontal
5	679.9970	56.69	38.47	-18.22	47.00	8.53	PK	100	139	Horizontal
6	947.6200	55.48	40.06	-15.42	47.00	6.94	PK	100	275	Horizontal

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	26.5 °C/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Huang Xinlong
Test Date	2023-07-25	Sample No.	E20230711057201-0007

Polarity: Vertical



Suspected Data List										
NO.	Freq. [MHz]	Reading [dB $\mu$ V/m]	Level [dB $\mu$ V/m]	Factor [dB]	Limit [dB $\mu$ V/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	37.2750	62.29	33.47	-28.82	40.00	6.53	PK	100	23	Vertical
2	41.6400	62.87	34.23	-28.64	40.00	5.77	PK	100	261	Vertical
3	61.2340	61.60	32.32	-29.28	40.00	7.68	PK	100	158	Vertical
4	540.0260	56.94	36.33	-20.61	47.00	10.67	PK	200	314	Vertical
5	679.9970	55.48	37.26	-18.22	47.00	9.74	PK	100	66	Vertical
6	947.6200	55.36	39.94	-15.42	47.00	7.06	PK	200	191	Vertical

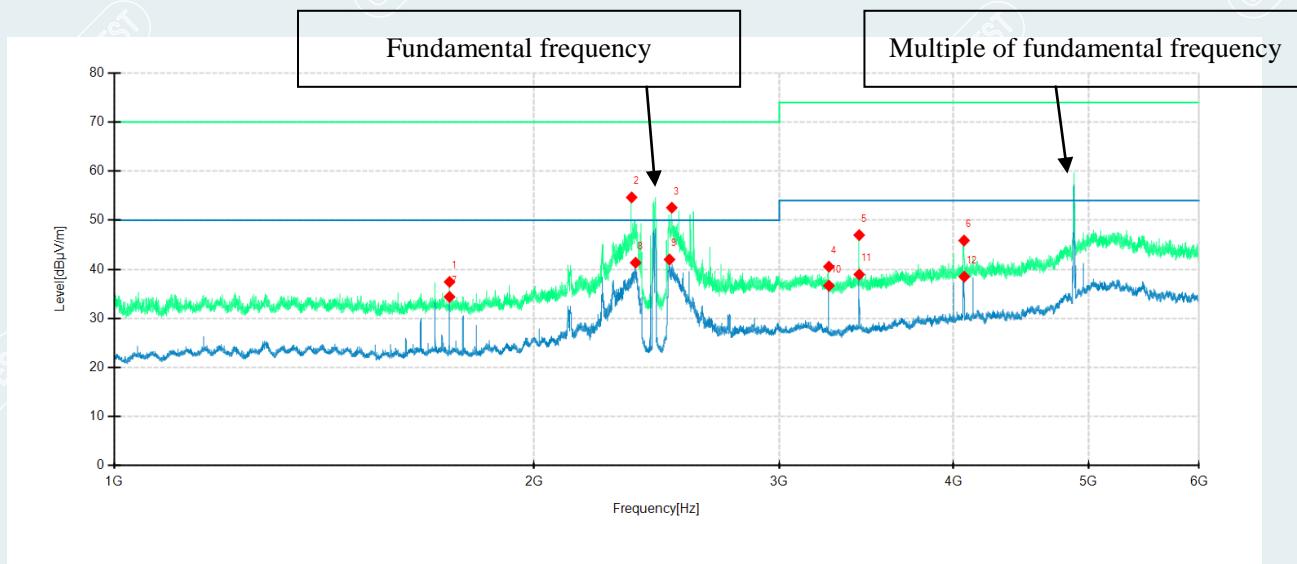
Final Data List										
NO.	Freq. [MHz]	Factor [dB]	QP Reading [dB $\mu$ V/m]	Level [dB $\mu$ V/m]	QP Limit [dB $\mu$ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	41.7991	-28.64	54.02	25.38	40.00	14.62	106	351.7	Vertical	PASS

**Remark:**

If the margin of the pre test results is greater than 6db, it meets the requirements of quasipeak or average values, and final testing is no longer required.

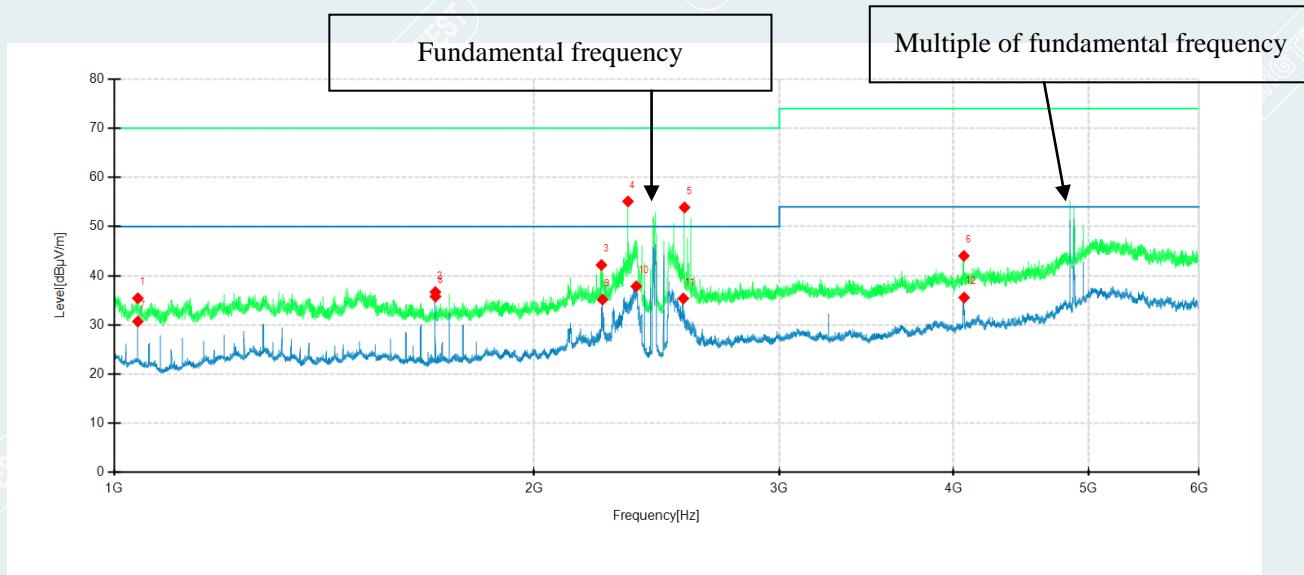
Above 1GHz

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	26.5°C/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Huang Xinlong
Test Date	2023-07-25	Sample No.	E20230711057201-0007



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1740.0000	56.75	37.44	-19.31	70.00	32.56	200	243	Horizontal
2	2350.6000	71.25	54.65	-16.60	70.00	15.35	200	180	Horizontal
3	2511.8000	67.60	52.56	-15.04	70.00	17.44	200	54	Horizontal
4	3255.9000	52.68	40.54	-12.14	74.00	33.46	100	16	Horizontal
5	3423.0000	58.36	46.97	-11.39	74.00	27.03	200	39	Horizontal
6	4070.4000	53.70	45.87	-7.83	74.00	28.13	200	129	Horizontal
7	1740.0000	53.70	34.39	-19.31	50.00	15.61	200	243	Horizontal
8	2366.0000	57.66	41.34	-16.32	50.00	8.66	100	334	Horizontal
9	2502.2000	57.27	42.00	-15.27	50.00	8.00	100	321	Horizontal
10	3255.9000	48.81	36.67	-12.14	54.00	17.33	100	16	Horizontal
11	3423.3000	50.34	38.94	-11.40	54.00	15.06	200	39	Horizontal
12	4071.6000	46.32	38.51	-7.81	54.00	15.49	200	140	Horizontal

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	26.5°C/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Huang Xinlong
Test Date	2023-07-25	Sample No.	E20230711057201-0007



Suspected Data List									
NO.	Freq. [MHz]	Reading [dB $\mu$ V/m]	Level [dB $\mu$ V/m]	Factor [dB]	Limit [dB $\mu$ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1039.8000	57.71	35.42	-22.29	70.00	34.58	100	91	Vertical
2	1699.8000	57.11	36.69	-20.42	70.00	33.31	200	16	Vertical
3	2236.0000	58.16	42.18	-15.98	70.00	27.82	100	217	Vertical
4	2336.4000	71.44	55.11	-16.33	70.00	14.89	100	357	Vertical
5	2565.2000	68.87	53.89	-14.98	70.00	16.11	100	15	Vertical
6	4069.2000	52.28	44.04	-8.24	74.00	29.96	100	37	Vertical
7	1039.8000	52.99	30.70	-22.29	50.00	19.30	100	78	Vertical
8	1700.0000	56.20	35.78	-20.42	50.00	14.22	100	360	Vertical
9	2240.2000	51.14	35.15	-15.99	50.00	14.85	100	331	Vertical
10	2368.4000	53.89	37.85	-16.04	50.00	12.15	100	319	Vertical
11	2560.0000	50.30	35.38	-14.92	50.00	14.62	100	319	Vertical
12	4070.7000	43.76	35.57	-8.19	54.00	18.43	100	24	Vertical

Remark: The fundamental frequency or multiple of fundamental frequency's limit is controlled to the standard of Radio frequency.

## 6.2 CONDUCTED EMISSION MEASUREMENT (CE)

Test Requirement: EN 301 489-1  
EN 301 489-17

Test Method: EN 55032:2015

### 6.2.1. LIMITS

Frequency (MHz)	Quasi-peak (dB $\mu$ V)	Average (dB $\mu$ V)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

**NOTE:** (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases in line with the logarithm of the frequency in the range of 0.15~0.5MHz.

### 6.2.2. TEST PROCEDURES

The test method shall be in accordance with CENELEC EN 55032 [1] annex A.3 and the Artificial Mains Networks (AMNs) shall be connected to the AC mains power source.

The measurement frequency range extends from 150 KHz to 30 MHz. When the EUT is a transmitter operating at frequencies below 30 MHz, then the exclusion band for transmitters applies for measurements in the transmit mode of operation.

#### (1) Procedure of Preliminary Test

For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). A EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:

--Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2m by 2m. This is physically accomplished as follows:

- 1) Place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or
- 2) Place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane.

-- All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane.

-- The AANs are placed on the floor that one side of the AAN housings is 40 cm from the vertical reference ground plane and other metallic parts.

-- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.

-- I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.

The test mode(s) were scanned during the preliminary test. After the preliminary scan, we found the test mode producing the highest emission level. The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

## (2) Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

### 6.2.3. TEST SETUP

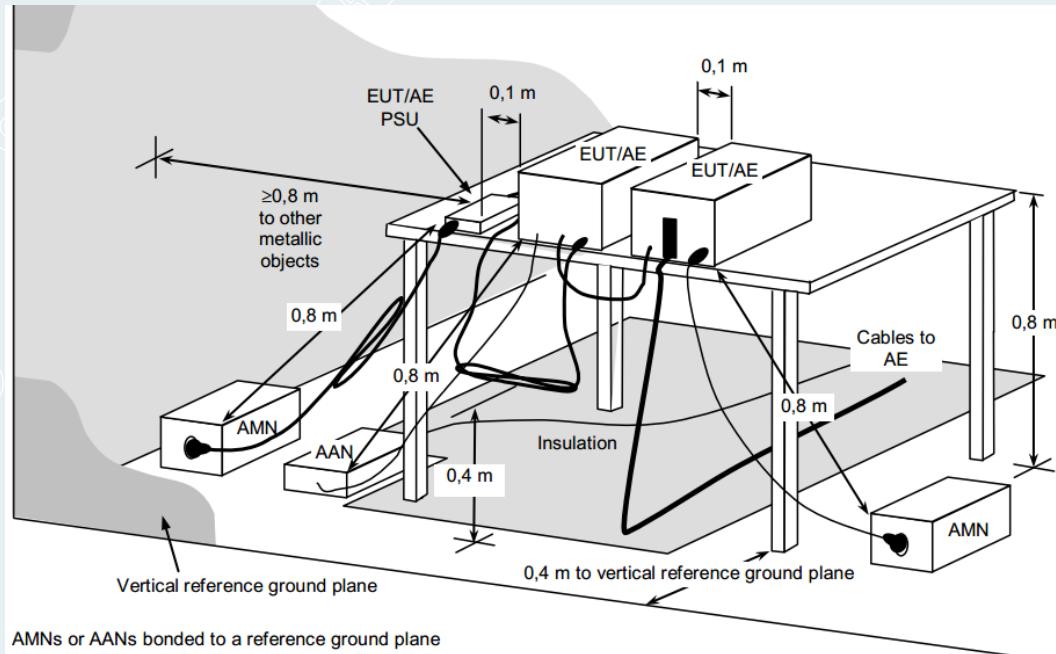


Figure 7.2-1: Test arrangement for Conducted emission measurement

### 6.2.4. DATE SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62

Factor = Insertion loss of LISN + Cable Loss  
 Result = Quasi-peak Reading/ Average Reading + Factor  
 Limit = Limit stated in standard  
 Margin = Result (dBuV) – Limit (dBuV)

### 6.2.5. PHOTOGRAPH OF THE TEST ARRANGEMENT

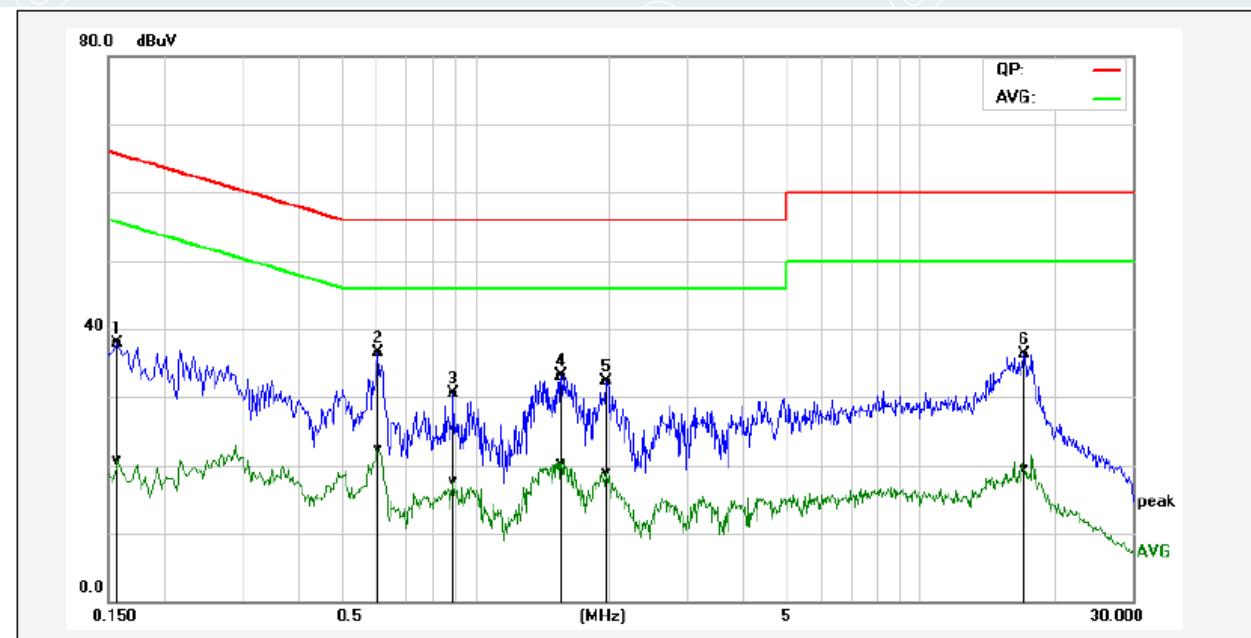
Please refer to the attached document E20230711057201-7-Test photo

### 6.2.6. TEST RESULTS

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	24.7°C/59%RH/101kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Zhou Wen
Test Date	2023-07-17	Sample No.	E20230711057201-0007

(The chart below shows the highest readings taken from the final data.)

Line: L1

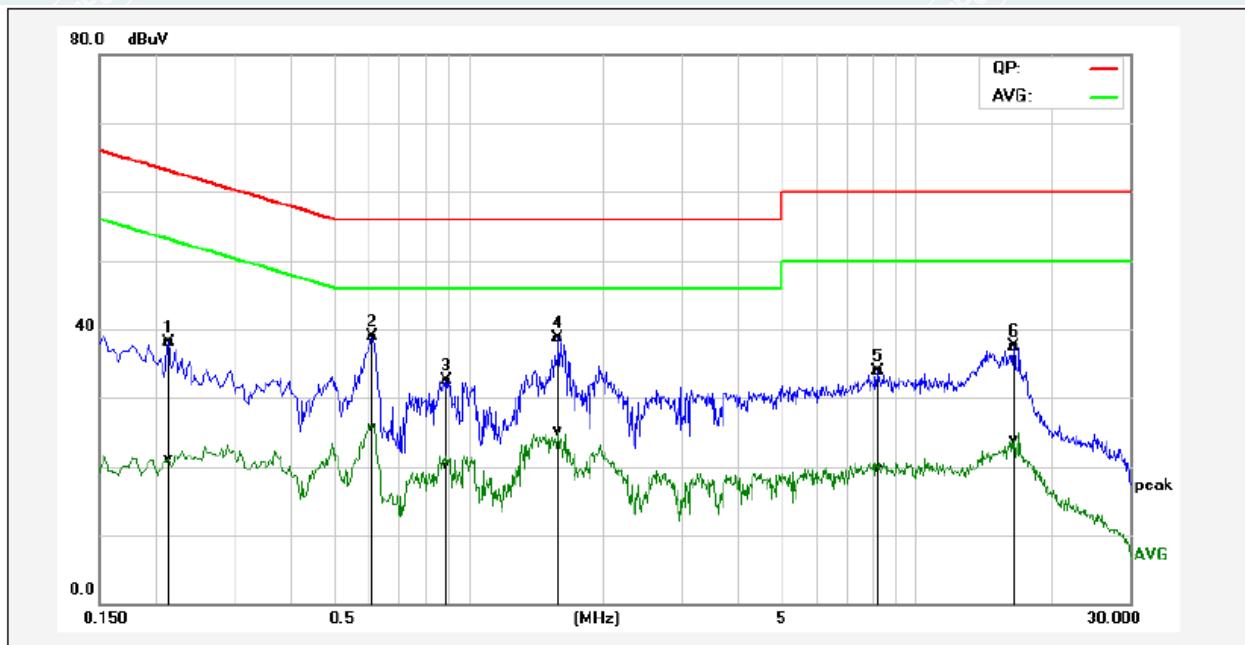


No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1580	28.26	10.99	9.67	37.93	20.66	65.56	55.57	-27.63	-34.91	Pass
2*	0.6060	26.72	12.52	9.69	36.41	22.21	56.00	46.00	-19.59	-23.79	Pass
3	0.8980	20.82	8.02	9.70	30.52	17.72	56.00	46.00	-25.48	-28.28	Pass
4	1.5660	23.47	10.50	9.72	33.19	20.22	56.00	46.00	-22.81	-25.78	Pass
5	1.9700	22.67	9.14	9.72	32.39	18.86	56.00	46.00	-23.61	-27.14	Pass
6	17.1380	26.36	9.53	9.91	36.27	19.44	60.00	50.00	-23.73	-30.56	Pass

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	24.7°C/59%RH/101kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Zhou Wen
Test Date	2023-07-17	Sample No.	E20230711057201-0007

(The chart below shows the highest readings taken from the final data.)

Line: N



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.2140	28.39	11.43	9.65	38.04	21.08	63.04	53.05	-25.00	-31.97	Pass
2*	0.6100	29.21	15.96	9.68	38.89	25.64	56.00	46.00	-17.11	-20.36	Pass
3	0.8980	22.72	10.56	9.70	32.42	20.26	56.00	46.00	-23.58	-25.74	Pass
4	1.5859	28.95	15.39	9.71	38.66	25.10	56.00	46.00	-17.34	-20.90	Pass
5	8.2220	24.01	9.90	9.81	33.82	19.71	60.00	50.00	-26.18	-30.29	Pass
6	16.5580	27.56	13.98	9.96	37.52	23.94	60.00	50.00	-22.48	-26.06	Pass

### 6.3 HARMONIC CURRENT

Test Requirement: ETSI EN 301 489-1  
ETSI EN 301 489-17  
EN IEC 61000-3-2

Test Method: EN 61000-3-2, EN IEC 61000-3-2

#### 6.3.1. LIMITS

Limits for Class A equipment		Limits for Class D equipment		
Harmonics Order n	Max. permissible harmonics current A	Harmonics Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics current A
Odd harmonics		Odd Harmonics only		
3	2.30	3	3.4	2.30
5	1.14	5	1.9	1.14
7	0.77	7	1.0	0.77
9	0.40	9	0.5	0.40
11	0.33	11	0.35	0.33
13	0.21	13	0.30	0.21
$15 \leq n \leq 39$	$0.15 \times 15/n$	$15 \leq n \leq 39$	$3.85/n$	$0.15 \times 15/n$
Even harmonics				
2	1.08			
4	0.43			
6	0.30			
$8 \leq n \leq 40$	$0.23 \times 8/n$			

**Note:**

1. Class A and Class D are classified according to item 7.4.3.
2. All equipment except for lighting equipment having an active input power > 75 W and no limits apply for equipment with an active input power up to and including 75 W.

----- The following blanks -----

### 6.3.2. TEST PROCEDURE

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The EUT is classified as follows:

Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.

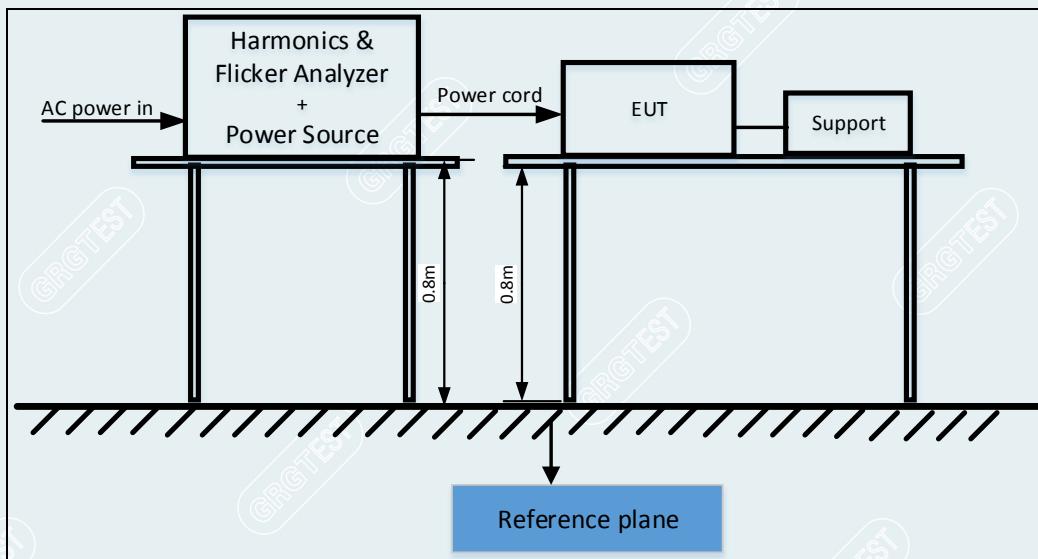
Class B: Portable tools; Arc welding equipment which is not professional equipment.

Class C: Lighting equipment.

Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.

The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

### 6.3.3. TEST SETUP



### 6.3.4. PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230711057201-7-Test photo

### 6.3.5. TEST RESULTS

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	23.7°C/47%RH/101kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Wang Xinyuan
Test Date	2023-07-31	Sample No.	E20230711057201-0007

Test category: Class-A (European limits)

Test Margin: 100

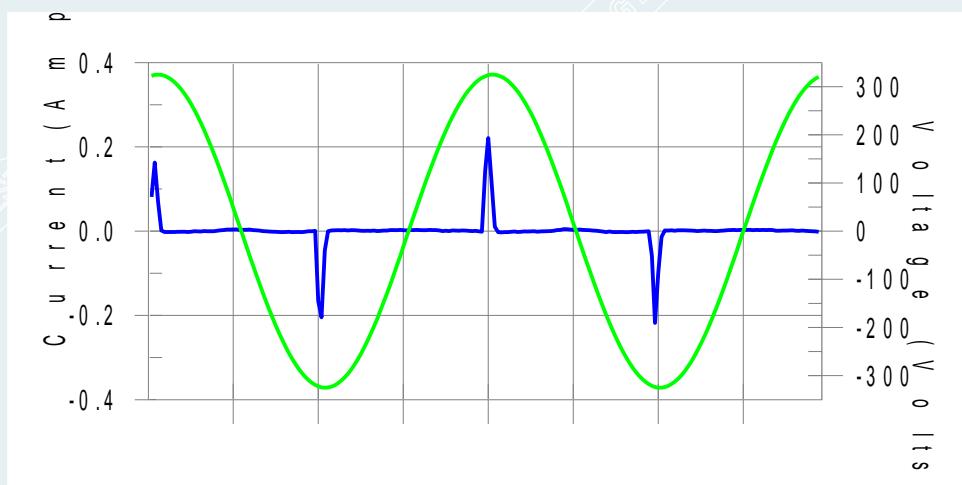
Test duration (min): 2.5

Data file name: H-000685.cts\_data

Test Result: Pass

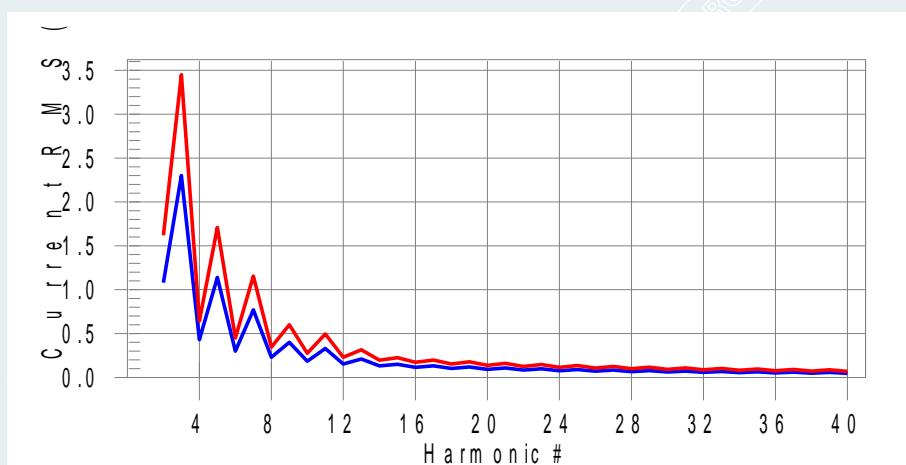
Source qualification: Normal

#### Current & voltage waveforms



#### Harmonics and Class A limit line

#### European Limits



Test result: Pass

Worst harmonics H25-4.2% of 150% limit, H23-6.3% of 100% limit

Test category: Class-A (European limits)

Test Margin: 100

Test duration (min): 2.5

Data file name: H-000685.cts\_data

Test Result: Pass

Source qualification: Normal

THC(A): 0.030

I-THD(%): 299.1

POHC(A): 0.015

POHC Limit(A): 0.251

**Highest parameter values during test:**

V\_RMS (Volts): 230.05

Frequency(Hz): 50.00

I\_Peak (Amps): 0.288

I\_RMS (Amps): 0.035

I\_Fund (Amps): 0.010

Crest Factor: 8.594

Power (Watts): 2.3

Power Factor: 0.310

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.001	1.620	N/A	Pass
3	0.010	2.300	0.4	0.011	3.450	0.3	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.010	1.140	0.8	0.010	1.710	0.6	Pass
6	0.000	0.300	N/A	0.001	0.450	N/A	Pass
7	0.009	0.770	1.2	0.010	1.155	0.8	Pass
8	0.000	0.230	N/A	0.001	0.345	N/A	Pass
9	0.009	0.400	2.3	0.009	0.600	1.5	Pass
10	0.000	0.184	N/A	0.001	0.276	N/A	Pass
11	0.009	0.330	2.7	0.009	0.495	1.8	Pass
12	0.000	0.153	N/A	0.001	0.230	N/A	Pass
13	0.008	0.210	4.0	0.009	0.315	2.7	Pass
14	0.000	0.131	N/A	0.001	0.197	N/A	Pass
15	0.008	0.150	5.4	0.008	0.225	3.6	Pass
16	0.000	0.115	N/A	0.001	0.173	N/A	Pass
17	0.008	0.132	5.8	0.008	0.198	3.9	Pass
18	0.000	0.102	N/A	0.001	0.153	N/A	Pass
19	0.007	0.118	6.0	0.007	0.178	4.1	Pass
20	0.000	0.092	N/A	0.001	0.138	N/A	Pass
21	0.007	0.107	6.2	0.007	0.161	4.2	Pass
22	0.000	0.084	N/A	0.001	0.125	N/A	Pass
23	0.006	0.098	6.3	0.006	0.147	4.2	Pass
24	0.000	0.077	N/A	0.001	0.115	N/A	Pass
25	0.006	0.090	6.3	0.006	0.135	4.2	Pass
26	0.000	0.071	N/A	0.001	0.107	N/A	Pass
27	0.005	0.083	6.2	0.005	0.125	4.2	Pass
28	0.000	0.066	N/A	0.001	0.099	N/A	Pass
29	0.005	0.078	N/A	0.005	0.116	N/A	Pass
30	0.000	0.061	N/A	0.001	0.092	N/A	Pass
31	0.004	0.073	N/A	0.004	0.109	N/A	Pass
32	0.000	0.058	N/A	0.001	0.086	N/A	Pass
33	0.004	0.068	N/A	0.004	0.102	N/A	Pass
34	0.000	0.054	N/A	0.001	0.081	N/A	Pass
35	0.003	0.064	N/A	0.003	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.003	0.061	N/A	0.003	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.003	0.058	N/A	0.003	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

**Test category: Class-A (European limits)**      **Test Margin: 100**  
**Test duration (min): 2.5**      **Data file name: H-000685.cts\_data**

**Test Result: Pass**      **Source qualification: Normal**

**Highest parameter values during test:**

Voltage (Vrms):	230.05	Frequency(Hz):	50.00
I_Peak (Amps):	0.288	I_RMS (Amps):	0.035
I_Fund (Amps):	0.010	Crest Factor:	8.594
Power (Watts):	2.3	Power Factor:	0.310

Harm#	Harmonics	V-rms	Limit V-rms	% of Limit	Status
2		0.170	0.460	36.85	OK
3		0.436	2.070	21.08	OK
4		0.058	0.460	12.63	OK
5		0.056	0.920	6.06	OK
6		0.032	0.460	6.99	OK
7		0.026	0.690	3.71	OK
8		0.029	0.460	6.38	OK
9		0.016	0.460	3.56	OK
10		0.031	0.460	6.65	OK
11		0.017	0.230	7.51	OK
12		0.018	0.230	7.94	OK
13		0.012	0.230	5.43	OK
14		0.013	0.230	5.54	OK
15		0.013	0.230	5.72	OK
16		0.016	0.230	6.96	OK
17		0.012	0.230	5.29	OK
18		0.015	0.230	6.51	OK
19		0.014	0.230	5.97	OK
20		0.011	0.230	4.63	OK
21		0.007	0.230	2.89	OK
22		0.009	0.230	3.73	OK
23		0.014	0.230	6.15	OK
24		0.005	0.230	2.10	OK
25		0.006	0.230	2.50	OK
26		0.011	0.230	4.72	OK
27		0.013	0.230	5.66	OK
28		0.008	0.230	3.32	OK
29		0.005	0.230	2.15	OK
30		0.007	0.230	3.14	OK
31		0.010	0.230	4.15	OK
32		0.006	0.230	2.59	OK
33		0.003	0.230	1.10	OK
34		0.004	0.230	1.52	OK
35		0.006	0.230	2.78	OK
36		0.003	0.230	1.23	OK
37		0.006	0.230	2.50	OK
38		0.003	0.230	1.36	OK
39		0.008	0.230	3.36	OK
40		0.005	0.230	2.04	OK

## 6.4 VOLTAGE FLUCTUATIONS AND FLICKER

Test Requirement: ETSI EN 301 489-1  
ETSI EN 301 489-17  
EN 61000-3-3

Test Method: EN 61000-3-3

### 6.4.1. LIMITS

Test Item	Limit	Remark
$P_{st}$	1.0	$P_{st}$ means short-term flicker indicator.
$P_{lt}$	0.65	$P_{lt}$ means long-term flicker indicator.
$T_{dt}$ (ms)	500	$T_{dt}$ means maximum time that $dt$ exceeds 3 %.
$d_{max}$ (%)	4%	$d_{max}$ means maximum relative voltage change.
dc (%)	3.3%	dc means relative steady-state voltage change

### 6.4.2. TEST PROCEDURES

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

### 6.4.3. TEST SETUP

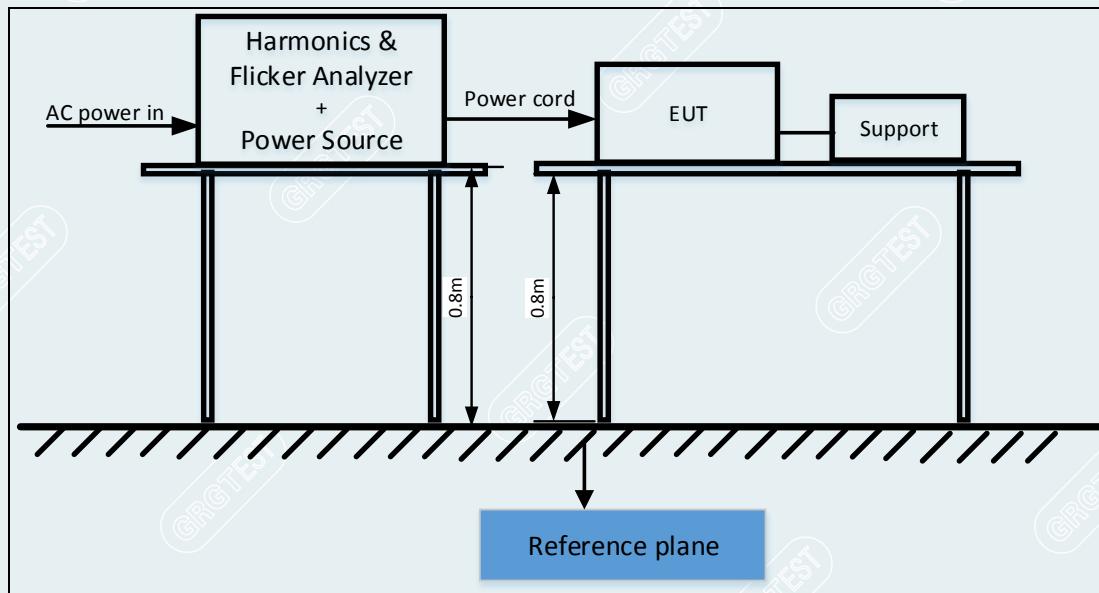


Figure 7.4-1: Test arrangement for Voltage fluctuations and flicker measurement.

#### 6.4.4. PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230711057201-7-Test photo

#### 6.4.5. TEST RESULTS

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	23.7°C/47%RH/101kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Wang Xinyuan
Test Date	2023-07-31	Sample No.	E20230711057201-0007

Test category: All parameters (European limits) Test Margin: 100

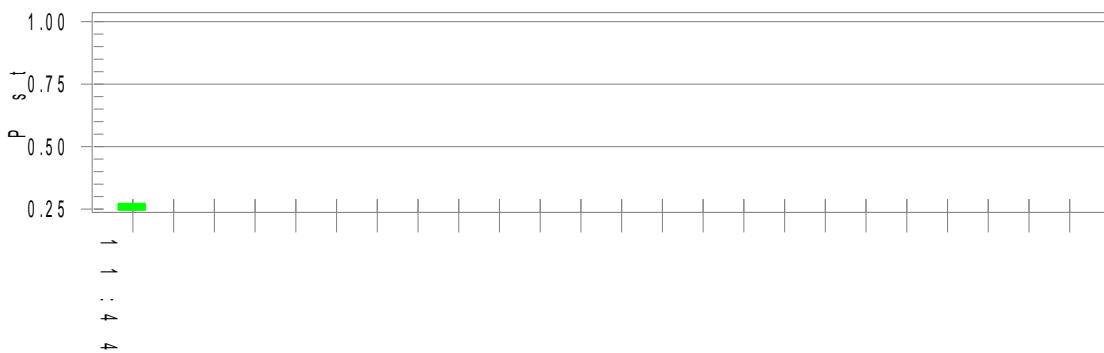
Test duration (min): 10 Data file name: F-000683.cts\_data

Test Result: Pass

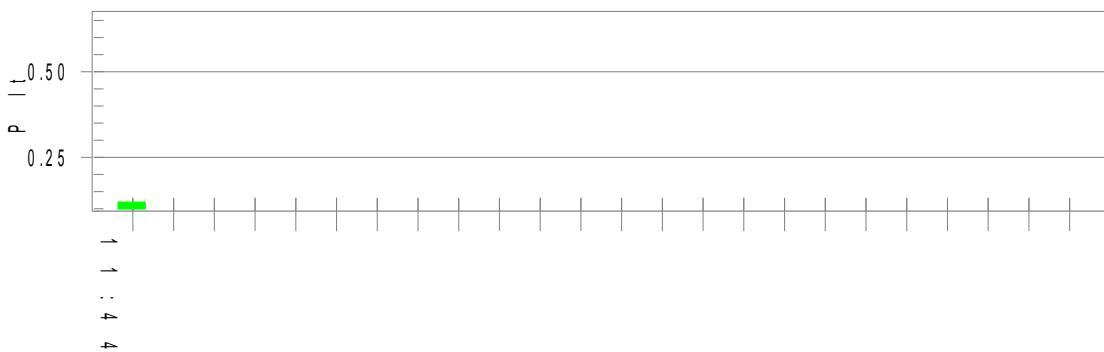
Status: Test Completed

##### Pst; and limit line

##### European Limits



##### Plt and limit line



##### Parameter values recorded during the test:

Vrms at the end of test (Volt): 230.02

Highest dt (%):

T-max (mS): 0

Highest dc (%): 0.00

Highest dmax (%): 0.00

Highest Pst (10 min. period): 0.273

Highest Plt (2 hr. period): /

Test limit (%):

Test limit (mS): 500.0

Pass

Test limit (%): 3.30

Pass

Test limit (%): 4.00

Pass

Test limit: 1.000

Pass

Test limit: 0.650

/

## 7. IMMUNITY TEST

### 7.1 GENERAL DESCRIPTION

EMC Immunity				
ETSI EN 301 489-1 & ETSI EN 301 489-17 & EN 55035				
Item	Application port	Basic Standard	Test method	Performance Criterion
Electrostatic discharge (ESD)	Enclosure port	ETSI EN 301 489-1 V2.2.3 (2019-11)/9.3 ETSI EN 301 489-17 V3.2.4 (2020-09) /7.2.1	EN 61000-4-2	Test specification: $\pm 2, \pm 4, \pm 8$ kV Air discharge $\pm 4$ kV Contact discharge Performance : Criteria B
		EN 55035:2017/A11:2020 Table 1	IEC 61000-4-2	
Radiated radio-frequency electromagnetic (RS)	Enclosure port	ETSI EN 301 489-1 V2.2.3 (2019-11)/9.2 ETSI EN 301 489-17 V3.2.4 (2020-09) /7.2.1	EN 61000-4-3	Test specification: Test level: For the frequency range 80MHz to 6000MHz, test level shall be 3 V/m, 80% AM(1kHz) Performance: Criteria A
Radiated radio-frequency electromagnetic (RS)	Enclosure port	EN 55035:2017/A11:2020 Table 1	IEC 61000-4-3	Test specification: Test level: For the frequency range 80MHz to 1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz test level shall be 3 V/m, 80% AM(1kHz) Performance: Criteria A
Electrical fast transients(EFT)	AC mains power input port/signal ports	ETSI EN 301 489-1 V2.2.3 /9.4 ETSI EN 301 489-17 V3.2.4 /7.2.1 EN 55035:2017/A11:2020 Table 4	EN 61000-4-4	Test specification: AC power Port: $\pm 1$ kV repetition rate: 5 kHz Performance: Criteria B
Surge	AC mains power input port	EN 301 489-1 V2.2.3 /9.8 EN 301 489-17 V3.2.4 /7.2.1	EN 61000-4-5	Test specification: AC Power Port: 1.2/50 us pulse line to line: $\pm 0.5$ kV, $\pm 1$ kV; Performance : Criteria B

Surge	AC mains power input port	EN 55035:2017/A11:2020 Table 4	IEC 61000-4-5	Test specification: AC Power Port: 1.2/50 us pulse line to line: $\pm 0.5$ kV, $\pm 1$ kV; Performance : Criteria B
Radio frequency continuous conducted(CS)	AC mains power input port	EN 301 489-1 V2.2.3 /9.5 EN 301 489-17 V3.2.4 /7.2.1	EN 61000-4-6	Test specification: AC power port 0.15~80 MHz, 3Vrms, 80% AM, 1kHz Performance: Criteria A
Radio frequency continuous conducted(CS)	AC mains power input port	EN 55035:2017/A11:2020 Table 4	IEC 61000-4-6	Test specification: AC power port 0.15~10 MHz, 3Vrms, 80% AM, 1kHz 10MHz ~ 30MHz, 3-1Vrms, 80% AM, 1kHz 30MHz ~ 80MHz, 1Vrms, 80% AM, 1kHz Performance: Criteria A
Power frequency magnetic field(PFMF)	Enclosure port	EN 55035:2017/A11:2020 Table 1	IEC 61000-4-8	1A/m 50Hz and 60Hz Performance Criterion A
Voltage Dips & Short Interruptions	AC mains power input port	EN 301 489-17 V3.2.4 /7.2.1 EN 301 489-1 V2.2.3 /9.7	EN 61000-4-11	Test specification: 1. Voltage dips: i)0% residual voltage 0.5 cycle. Performance: Criteria B; ii) 0% residual voltage 1 cycle, Performance: Criteria B; iii)70% residual voltage 25 cycle. Performance: Criteria C; 2. Voltage interruption: 0% residual voltage during 250 cycles. Performance: Criteria C;
Voltage Dips & Short Interruptions	AC mains power input port	EN 55035:2017/A11:2020 Table 4	IEC 61000-4-11	Test specification: 1. Voltage dips: i)0% residual voltage 0.5 cycle. Performance: Criteria B; ii) 70% residual voltage 25 cycle for 50Hz, Performance: Criteria C; 2. Voltage interruption: 0% residual voltage during 250 cycles for 50Hz. Performance: Criteria C;

## 7.2 GENERAL PERFORMANCE CRITERIA DESCRIPTION (ETSI EN 301 489-1-17)

### 7.2.1 GENERAL PERFORMANCE CRITERIA

The performance criteria are:

- Performance criteria A for immunity tests with phenomena of a continuous nature;
- Performance criteria B for immunity tests with phenomena of a transient nature;
- Performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

**Performance table**

Criteria	During Test	After test (i.e. as a result of the application of the test)
A	Shall operate as intended. (See note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
B	May be loss of function.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
C	May be loss of function.	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.

NOTE: Operate as intended during the test allows a level of degradation in accordance with clause 6.2.2.

Performance Criteria	Description
Performance criteria for continuous phenomena applied to transmitters and receivers	If no further details are given in the relevant part of EN 301 489 series [i.13] dealing with the particular type of radio equipment, the following general performance criteria for continuous phenomena shall apply. During and after the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance. During the test the EUT shall not unintentionally transmit or change its actual operating state and stored data. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.
Performance criteria for transient phenomena applied to transmitters and receivers	If no further details are given in the relevant part of EN 301 489 series [i.13] dealing with the particular type of radio equipment, the following general performance criteria for transient phenomena shall apply. For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies: <ul style="list-style-type: none"> <li>• For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A SW reboot is not allowed.</li> </ul>

	<p>Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</p> <ul style="list-style-type: none"> <li>For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. A SW reboot is not allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</li> </ul> <p>For all other ports the following applies:</p> <ul style="list-style-type: none"> <li>After the test, the equipment shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer, when the equipment is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance.</li> <li>During the EMC exposure to an electromagnetic phenomenon, a degradation of performance is, however, allowed. No change of the actual mode of operation (e.g. unintended transmission) or stored data is allowed.</li> <li>If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.</li> </ul>
Performance criteria for equipment which does not provide a continuous communication link	For radio equipment which does not provide a continuous communication link, the performance criteria described in clauses 6.1 and 6.2 are not appropriate, in these cases the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests. The performance specification shall be included in the product description and documentation. The related specifications set out in clause 5.3 have also to be taken into account. The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in clauses 6.1 and 6.2.
Performance criteria for ancillary equipment tested on a stand alone basis	If ancillary equipment is intended to be tested on a stand alone basis, the performance criteria described in clauses 6.1 and 6.2 are not appropriate, in these cases the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests. The performance specification shall be included in the product description and documentation. The related specifications set out in clause 5.3 have also to be taken into account. The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in clauses 6.1 and 6.2.

Performance Criteria	Description
CT	<p>The performance criteria A shall apply.</p> <p>Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an ACKnowledgement (ACK) or Not ACKnowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.</p>
TT	<p>The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.</p>
CR	<p>The performance criteria A shall apply.</p> <p>Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.</p>
TR	<p>The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration for which performance criteria C shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.</p>

Note:

Criterion A applies for immunity tests with phenomena of a continuous nature. (CT, CR)

Criterion B applies for immunity tests with phenomena of a transient nature. (TT, TR)

Criterion C for immunity tests with power interruptions exceeding a certain time.

## 7.2.2 MINIMUM PERFORMANCE LEVEL

For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.

### 7.2.3 PERFORMANCE CRITERIA FOR CONTINUOUS PHENOMENA

The performance criteria A shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur during the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur during the test.

### 7.2.4 PERFORMANCE CRITERIA FOR TRANSIENT PHENOMENA

The performance criteria B shall apply, except for voltage dips greater than or equal to 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur as a result of the application of the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur as a result of the application of the test.

## 7.3 GENERAL PERFORMANCE CRITERIA DESCRIPTION (EN 55035)

### 7.3.1 GENERAL PERFORMANCE CRITERIA

#### Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### Performance criterion B

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed.

Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

## 7.4 ELECTROSTATIC DISCHARGE(ESD)

### 7.4.1 TEST SPECIFICATION

Test Requirement:	EN 301 489-1 EN 301 489-17 EN 55035
Test Method:	EN 61000-4-2, IEC 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Air Discharge : $\pm 2$ kV, $\pm 4$ kV, $\pm 8$ kV; Contact Discharge: $\pm 4$ kV
Polarity:	Positive & Negative
Number of Discharge:	10 times at each test point
Discharge Mode:	Single Discharge 1 second

### 7.4.2 TEST PROCEDURE

The basic test procedure was in accordance with EN 61000-4-2 & IEC 61000-4-2:

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- (1) The test shall be performed with single discharges. On each pre-selected point at least 10single discharges (in the most sensitive polarity) shall be applied.

NOTE 1 The minimum number of discharges applied is depending on the EUT; for products with synchronized circuits the number of discharges should be larger.

For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

NOTE 2 The points to which the discharges should be applied may be selected by means of an exploration carried out at a repetition rate of 20 discharges per second, or more.

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1mfrom, the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

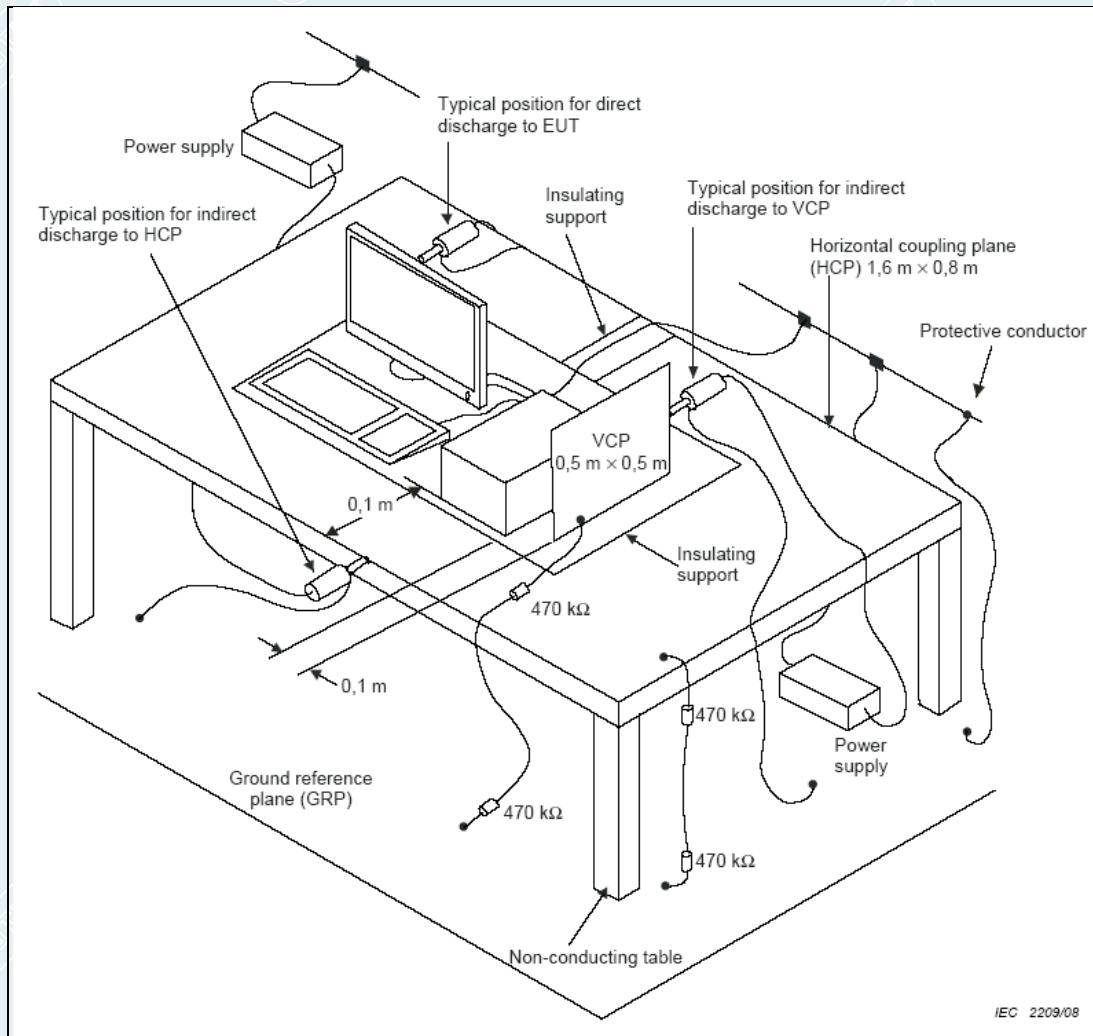
- (2) Air discharges at insulation surfaces of the EUT.

It was at least ten single discharges with positive and negative at the same selected point.

- (3) For TABLE-TOP equipment:

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test was installed in a representative system as described in EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

#### 7.4.3 TEST SETUP



#### 7.4.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230711057201-7-Test photo

### 7.4.5 TEST RESULTS

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	23.7°C/47%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Wang Xinyuan
Test Date	2023-08-02	Sample No.	E20230711057201-0007

For EN 301 489-1 /EN 301 489-17:

Discharge point	Discharge voltage	C-Conduct A-Air	Required Performance	Actual performance	Result
Vertical coupling plane	±4kV	C	Criterion B	Criterion A <sup>1)</sup>	PASS
Horizontal coupling plane	±4kV	C	Criterion B	Criterion A <sup>1)</sup>	PASS
Shell gap	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A <sup>1)</sup>	PASS
Indicator light	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A <sup>1)</sup>	PASS
Button	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A <sup>1)</sup>	PASS
Power supply port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A <sup>1)</sup>	PASS
Camera	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A <sup>1)</sup>	PASS
Horn	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A <sup>1)</sup>	PASS
TF card port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A <sup>1)</sup>	PASS

**Note:**<sup>1)</sup> Before test, during test and after test, the EUT working is normal, the EUT function is normal.

----- The following blanks -----

For EN55035:

Discharge point	Discharge voltage	C-Conduct A-Air	Required Performance	Actual performance	Result
Vertical coupling plane	$\pm 4\text{kV}$	C	Criterion B	Criterion A <sup>1)</sup>	PASS
Horizontal coupling plane	$\pm 4\text{kV}$	C	Criterion B	Criterion A <sup>1)</sup>	PASS
Shell gap	$\pm 2\text{kV}, \pm 4\text{kV}, \pm 8\text{kV}$	A	Criterion B	Criterion A <sup>1)</sup>	PASS
Indicator light	$\pm 2\text{kV}, \pm 4\text{kV}, \pm 8\text{kV}$	A	Criterion B	Criterion A <sup>1)</sup>	PASS
Button	$\pm 2\text{kV}, \pm 4\text{kV}, \pm 8\text{kV}$	A	Criterion B	Criterion A <sup>1)</sup>	PASS
Power supply port	$\pm 2\text{kV}, \pm 4\text{kV}, \pm 8\text{kV}$	A	Criterion B	Criterion A <sup>1)</sup>	PASS
Camera	$\pm 2\text{kV}, \pm 4\text{kV}, \pm 8\text{kV}$	A	Criterion B	Criterion A <sup>1)</sup>	PASS
Horn	$\pm 2\text{kV}, \pm 4\text{kV}, \pm 8\text{kV}$	A	Criterion B	Criterion A <sup>1)</sup>	PASS
TF card port	$\pm 2\text{kV}, \pm 4\text{kV}, \pm 8\text{kV}$	A	Criterion B	Criterion A <sup>1)</sup>	PASS
<b>Note:</b> <sup>1)</sup> Before test, during test and after test, the EUT working is normal, the EUT function is normal.					

----- The following blanks -----

## 7.5 RADIATED RADIO-FREQUENCY ELECTROMAGNETIC FIELD (RS)

### 7.5.1 TEST SPECIFICATION

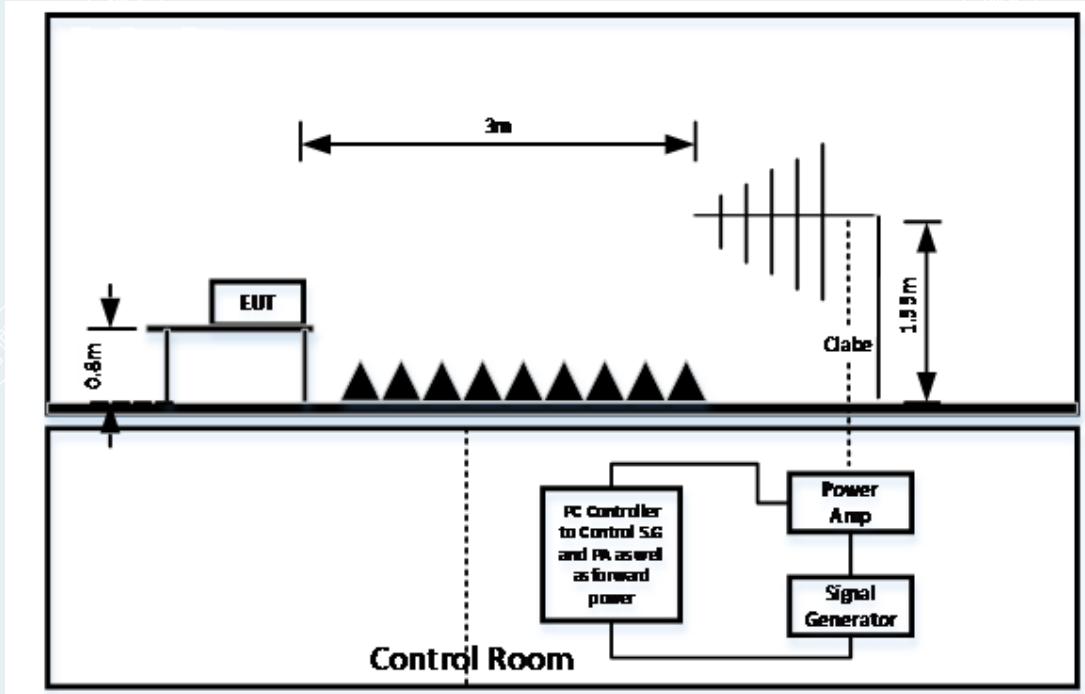
Test Requirement:	EN 301 489-1 EN 301 489-17 EN 55035
Test Method:	EN 61000-4-3, IEC 61000-4-3
Frequency Range:	EN 301 489-1, EN 301 489-17: 80MHz ~ 6000MHz EN 55035: 80MHz~1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.55m

### 7.5.2 TEST PROCEDURE

- (1) The testing is performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- (2) The frequency range is swept from 80 MHz ~6000 MHz, with the signal 80% amplitude modulated with a 1 kHz sine-wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s, where the frequency range is swept incrementally; the step size is 1% of preceding frequency value.
- (3) The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- (4) The test is performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

----- The following blanks -----

### 7.5.3 TEST SETUP



#### NOTE:

##### (1) Table-top equipment

The EUT installed in a representative system as described in section 7.1 of EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

##### (2) Floor-standing equipment

The EUT installed in a representative system as described in section 7.2 of EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

**Note: the EUT is a table-top equipment.**

### 7.5.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230711057201-7-Test photo

### 7.5.5 TEST RESULTS

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	23.7°C/47%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Wang Xinyuan
Test Date	2023-07-31	Sample No.	E20230711057201-0007

For EN 301 489-1/ EN 301 489-17:

Frequency (MHz)	Field strength (V/m)	EUT orientation	Antenna polarization	Required criterion	Actual performance	Result
80~6000	3	Front	H	Criterion A	Criterion A <sup>1)</sup>	pass
			V	Criterion A	Criterion A <sup>1)</sup>	pass
		Left	H	Criterion A	Criterion A <sup>1)</sup>	pass
			V	Criterion A	Criterion A <sup>1)</sup>	pass
		Right	H	Criterion A	Criterion A <sup>1)</sup>	pass
			V	Criterion A	Criterion A <sup>1)</sup>	pass
		Rear	H	Criterion A	Criterion A <sup>1)</sup>	pass
			V	Criterion A	Criterion A <sup>1)</sup>	pass

NOTE: <sup>1)</sup> Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

For EN 55035:

Frequency (MHz)	Field strength (V/m)	EUT orientation	Antenna polarization	Required criterion	Actual performance	Result
80~1000	3	Front	H	Criterion A	Criterion A <sup>1)</sup>	pass
			V	Criterion A	Criterion A <sup>1)</sup>	pass
		Left	H	Criterion A	Criterion A <sup>1)</sup>	pass
			V	Criterion A	Criterion A <sup>1)</sup>	pass
		Right	H	Criterion A	Criterion A <sup>1)</sup>	pass
			V	Criterion A	Criterion A <sup>1)</sup>	pass
		Rear	H	Criterion A	Criterion A <sup>1)</sup>	pass
			V	Criterion A	Criterion A <sup>1)</sup>	pass
		Front	H	Criterion A	Criterion A <sup>1)</sup>	pass
			V	Criterion A	Criterion A <sup>1)</sup>	pass
		Left	H	Criterion A	Criterion A <sup>1)</sup>	pass
			V	Criterion A	Criterion A <sup>1)</sup>	pass
		Right	H	Criterion A	Criterion A <sup>1)</sup>	pass
			V	Criterion A	Criterion A <sup>1)</sup>	pass
		Rear	H	Criterion A	Criterion A <sup>1)</sup>	pass
			V	Criterion A	Criterion A <sup>1)</sup>	pass

NOTE: <sup>1)</sup> Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

## 7.6 ELECTRICAL FAST TRANSIENTS (EFT)

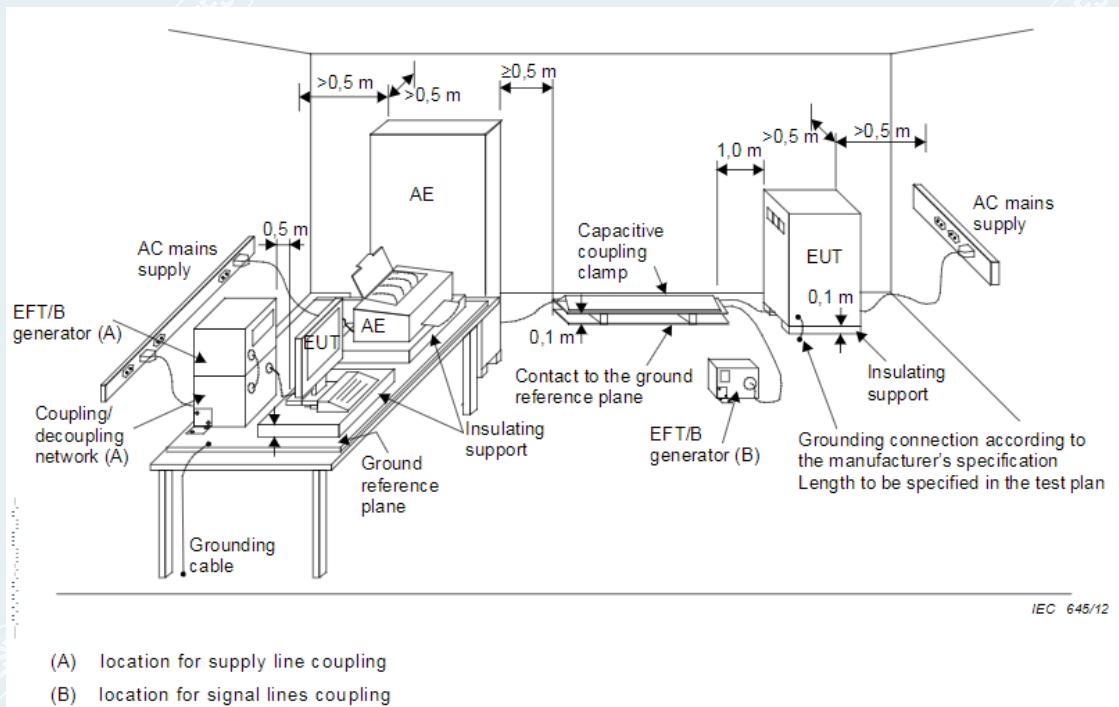
### 7.6.1 TEST SPECIFICATION

Test Requirement:	EN 301 489-1 EN 301 489-17 EN 55035
Test Method:	EN 61000-4-4
Test Voltage:	AC power Port: $\pm 1\text{kV}$
Polarity:	Positive and Negative
Impulse Frequency:	5 kHz
Impulse Wave-shape:	5 ns/50ns for voltage
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	1 min for each polarity

### 7.6.2 TEST PROCEDURE

- (1) EUTs, whether stationary floor-mounted or table top, and equipment designed to be mounted in other configurations, shall be placed on a ground reference plane and shall be insulated from it by an insulating support  $0.1\text{ m} \pm 0.01\text{ m}$  thick. The test generator and the coupling/ decoupling network shall be placed directly on, and bonded to, the ground reference plane.
- (2) The minimum distance between the EUT and all other conductive structures (e.g. the walls of a shielded room), except the ground reference plane shall be more than 0.5 m. If the manufacturer provides a non-detachable supply cable more than  $0.5\text{ m} \pm 0.05\text{ m}$  long with the equipment, the excess length of this cable shall be folded to avoid a flat coil and situated at a distance of 0,1 m above the ground reference plane.
- (3) For input and AC power ports:  
The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test can't less than 1min.
- (4) The transient/burst waveform was in accordance with EN 61000-4-4, 5/50ns.

### 7.6.3 TEST SETUP



### 7.6.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230711057201-7-Test photo

----- The following blanks -----

### 7.6.5 TEST RESULTS

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	23.7°C/47%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Wang Xinyuan
Test Date	2023-07-31	Sample No.	E20230711057201-0007

For EN 301489-1/ EN 301489-17:

Test Point	Polarity	Test Level (kV)	Required Performance	Actual performance	Result
L	+	1	Criterion B	Criterion A <sup>1)</sup>	PASS
	-	1	Criterion B	Criterion A <sup>1)</sup>	PASS
N	+	1	Criterion B	Criterion A <sup>1)</sup>	PASS
	-	1	Criterion B	Criterion A <sup>1)</sup>	PASS
L-N	+	1	Criterion B	Criterion A <sup>1)</sup>	PASS
	-	1	Criterion B	Criterion A <sup>1)</sup>	PASS

NOTE: <sup>1)</sup>Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

For EN 55035:

Test Point	Polarity	Test Level (kV)	Required Performance	Actual performance	Result
L	+	1	Criterion B	Criterion A <sup>1)</sup>	PASS
	-	1	Criterion B	Criterion A <sup>1)</sup>	PASS
N	+	1	Criterion B	Criterion A <sup>1)</sup>	PASS
	-	1	Criterion B	Criterion A <sup>1)</sup>	PASS
L-N	+	1	Criterion B	Criterion A <sup>1)</sup>	PASS
	-	1	Criterion B	Criterion A <sup>1)</sup>	PASS

NOTE: <sup>1)</sup>Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

## 7.7 SURGES

### 7.7.1 TEST SPECIFICATION

Test Requirement:	EN 301 489-1 EN 301 489-17 EN 55035
Test Method:	EN 61000-4-5, IEC 61000-4-5
Wave-Shape:	AC power supply port: Combination Wave 1.2/50 µs Open Circuit Voltage 8/20µs Short Circuit Current
Test Voltage:	AC Port: line to line: ±0.5 kV, ±1 kV
Generator Source Impedance:	AC power supply port: Line to line 2ohm
Polarity:	Positive and Negative
Phase Angle:	EN 301 489-1 / EN 301 489-17:0 °, 90 °, 180 °, 270 ° EN 55035: +90 °, -270 °
Pulse Repetition Rate:	1 minute
Number of tests:	5 positive and 5 negative at the selected points

### 7.7.2 TEST PROCEDURE

(1) For EUT power supply:

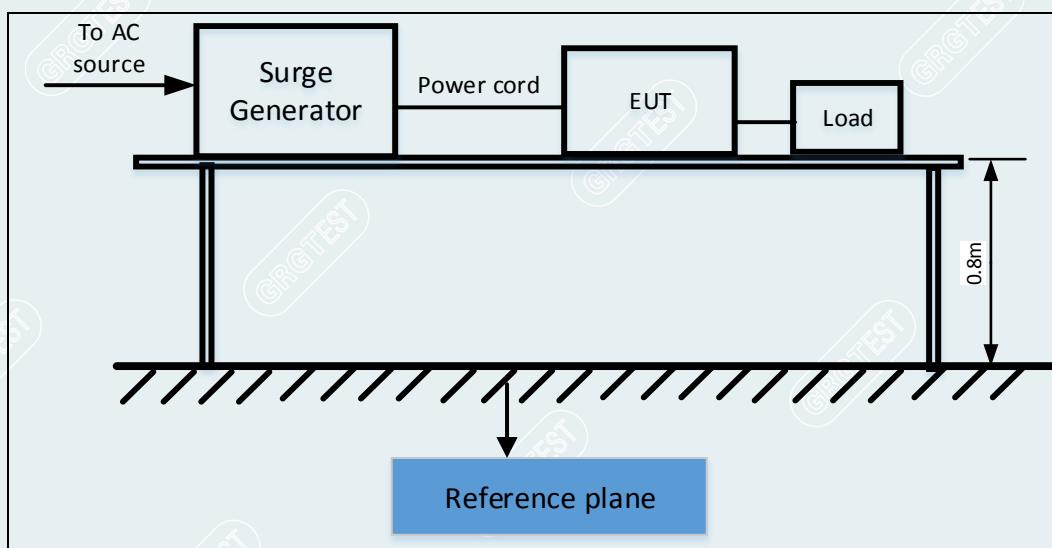
The surge is applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

(2) For test applied to unshielded un-symmetrically operated interconnection lines of EUT: The surge was applied to the lines via the capacitive coupling. The coupling / decoupling networks didn't influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

(3) For test applied to unshielded symmetrically operated interconnection / telecommunication lines of EUT:

The surge was applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestors were not specified. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

### 7.7.3 TEST SETUP



----- The following blanks -----

#### 7.7.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230711057201-7-Test photo

#### 7.7.5 TEST RESULTS

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	23.7°C/47%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Wang Xinyuan
Test Date	2023-07-31	Sample No.	E20230711057201-0007

For EN 301489-1/EN 301489-17:

Test port	Polarity	Test Level	Phase	Required Performance	Actual performance	Result
L-N	+/-	0.5kV	0 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	+/-	0.5kV	90 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	+/-	0.5kV	180 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	+/-	0.5kV	270 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	+/-	1kV	0 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	+/-	1kV	90 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	+/-	1kV	180 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	+/-	1kV	270 °	Criterion B	Criterion A <sup>1)</sup>	PASS

NOTE: <sup>1)</sup>Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

For EN 55035:

Test port	Polarity	Test Level	Phase	Required Performance	Actual performance	Result
L-N	+	0.5kV	+90 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	-	0.5kV	-270 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	+	1kV	+90 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	-	1kV	-270 °	Criterion B	Criterion A <sup>1)</sup>	PASS

NOTE: <sup>1)</sup>Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

## 7.8 RADIO FREQUENCY CONTINUOUS CONDUCTED (CS)

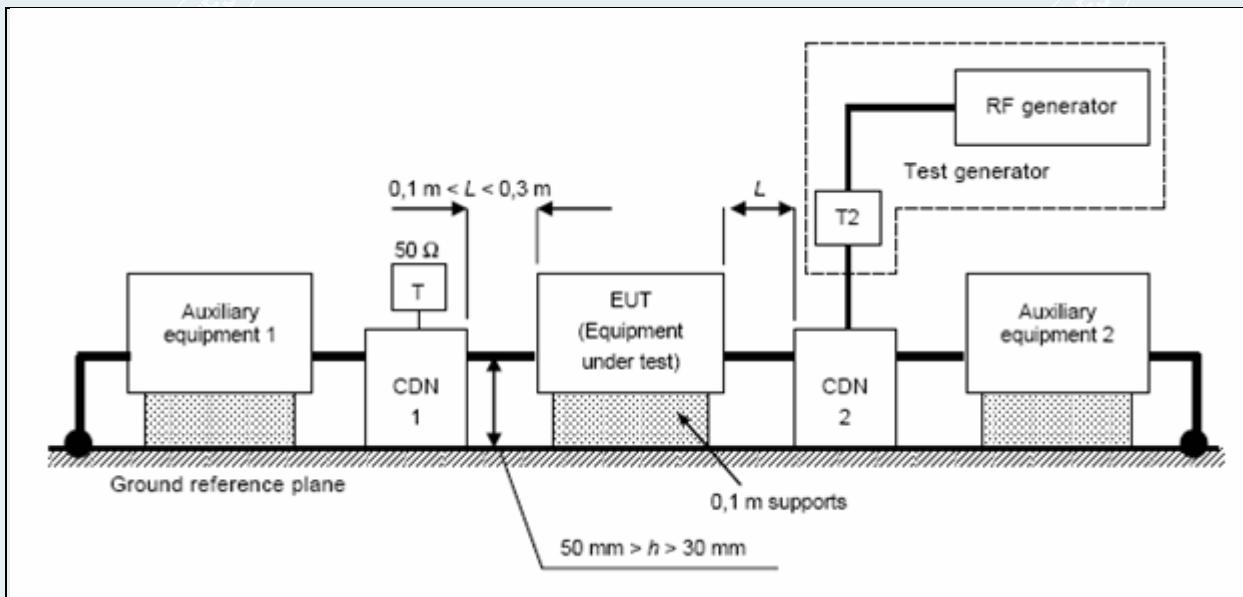
### 7.8.1 TEST SPECIFICATION

Test Requirement:	EN 301 489-1 EN 301 489-17 EN 55035
Test Method:	EN 61000-4-6, IEC 61000-4-6
Frequency Range:	0.15 MHz~80 MHz
Field Strength:	EN 301 489-1 / EN 301 489-17: 0.15-80MHz: 3V (r.m.s), 80%, 1kHz EN 55035: 0.15-10MHz: 3V (r.m.s), 80%, 1kHz 10-30MHz: 3V (r.m.s), 80%, 1kHz 30-80MHz: 1V (r.m.s), 80%, 1kHz
Modulation:	1 kHz, 80% AM
Frequency Step:	1% of the preceding frequency value
Dwell Time:	1s

### 7.8.2 TEST PROCEDURE

- (1) Set up the EUT, CDN and Injection clamp as shown on Section 8.5.3
- (2) Let the EUT work in test mode and measure it.
- (3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- (4) The disturbance signal described below is injected to EUT through CDN.
- (5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- (6) The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- (7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

### 7.8.3 TEST SETUP



----- The following blanks -----

#### 7.8.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230711057201-7-Test photo

#### 7.8.5 TEST RESULTS

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	23.7°C/47%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Wang Xinyuan
Test Date	2023-07-31	Sample No.	E20230711057201-0007

For EN 301489-1 / EN 301489-17:

Test Ports	Frequency Band(MHz)	Field Strength (Vrms)	Injection Method	Required Performance	Actual performance	Result
Power port	0.15~80	3	CDN	Criterion A	Criterion A <sup>1)</sup>	Pass

NOTE: <sup>1)</sup> Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

For EN 55035:

Test Ports	Frequency Band(MHz)	Field Strength (Vrms)	Injection Method	Required Performance	Actual performance	Result
Power port	0.15~10	3	CDN	Criterion A	Criterion A <sup>1)</sup>	Pass
	10~30	3 to 1 <sup>2)</sup>	CDN	Criterion A	Criterion A <sup>1)</sup>	Pass
	30~80	1	CDN	Criterion A	Criterion A <sup>1)</sup>	Pass

NOTE: <sup>1)</sup> Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

<sup>2)</sup>The limit decreases linearly with the logarithm of the frequency in the range 10MHz to 30MHz.

----- The following blanks -----

## 7.9 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

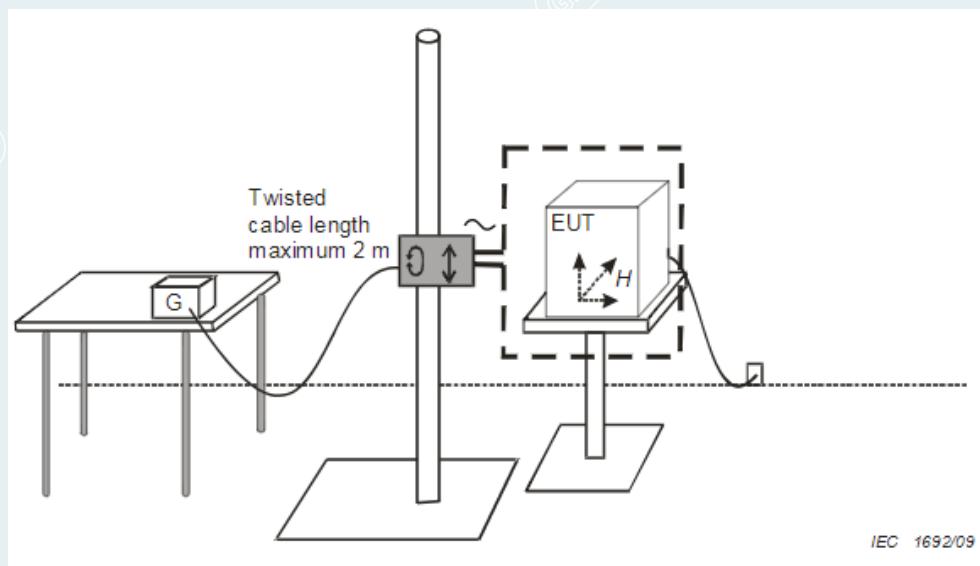
### 7.9.1 TEST SPECIFICATION

Test Requirement	EN 55035
Test Method	IEC 61000-4-8
Frequency	50Hz and 60Hz
Field Strength	1 A/m
Observation Time	5 min
Inductance Coil	Rectangular type, 1mx1m
Direction	X-axis, Y-axis, Z-axis

### 7.9.2 TEST PROCEDURE

- a) The equipment is configured and connected to satisfy its functional requirements. It shall be placed on the GRP with the interposition of a 0.1m-thick insulating support.
- b) The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- c) The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.
- d) The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

### 7.9.3 TEST SETUP



#### 7.9.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230711057201-7-Test photo

#### 7.9.5 TEST RESULTS

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	23.7°C/47%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Wang Xinyuan
Test Date	2023-07-31	Sample No.	E20230711057201-0007

For EN 55035:

Field Strength (A/m)	Frequency (Hz)	Observation Time (min)	Direction	Required Performance	Actual performance	Result
1	50	5	X	A	A <sup>1)</sup>	PASS
1	50	5	Y	A	A <sup>1)</sup>	PASS
1	50	5	Z	A	A <sup>1)</sup>	PASS
1	60	5	X	A	A <sup>1)</sup>	PASS
1	60	5	Y	A	A <sup>1)</sup>	PASS
1	60	5	Z	A	A <sup>1)</sup>	PASS

**Note:**<sup>1)</sup> Before test, during test and after test, the EUT working is normal, the EUT function is normal.

----- The following blanks -----

## 7.10 VOLTAGE DIPS & SHORT INTERRUPTIONS

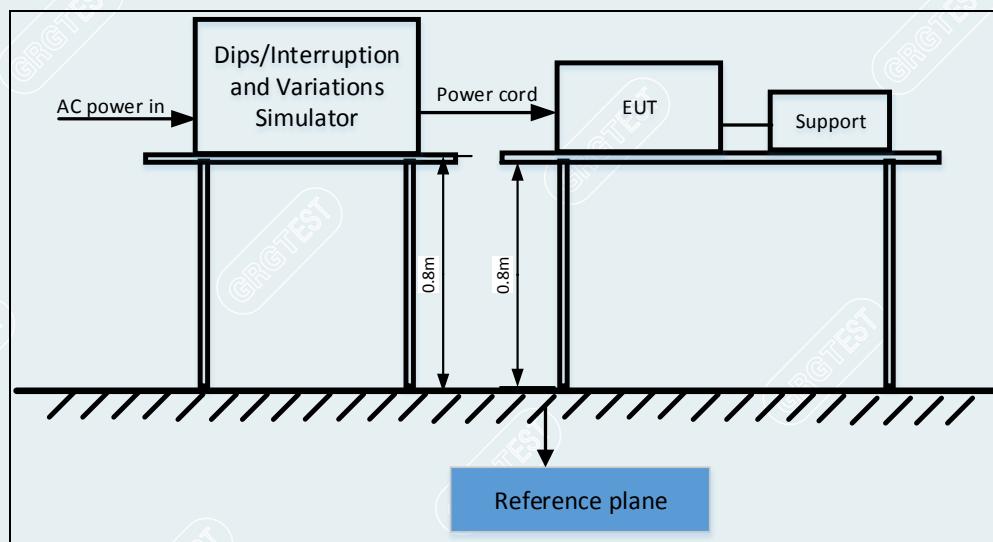
### 7.10.1 TEST SPECIFICATION

Test Requirement:	EN 301 489-1 EN 301 489-17 EN 55035
Test Method:	EN 61000-4-11, IEC 61000-4-11
Test duration time:	EN 301 489-1 / EN 301 489-17 Test specification: 1. Voltage dips: i) 0% residual voltage 0.5 cycle. Performance: Criteria B; ii) 0% residual voltage 1 cycle, Performance: Criteria B; iii) 70% residual voltage 25 cycle. Performance: Criteria C; 2. Voltage interruption: 0% residual voltage during 250 cycles. Performance: Criteria C; EN 55035 Test specification: 1. Voltage dips: i) 0% residual voltage 0.5 cycle. Performance: Criteria B; ii) 70% residual voltage 25 cycle. Performance: Criteria C; 2. Voltage interruption: 0% residual voltage during 250 cycles. Performance: Criteria C
Interval between event:	10s for each dips at each test angle
Phase Angle:	EN 55035: 0 °, 180 ° EN 301 489-1/ EN 301 489-17: 0 °, 180 °
Test cycle:	3

### 7.10.2 TEST PROCEDURE

- (1) The EUT and test generator were setup as shown on Section
- (2) The interruption is introduced at selected phase angles with specified duration.
- (3) Record any degradation of performance.

### 7.10.3 TEST SETUP



----- The following blanks -----

#### 7.10.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230711057201-7-Test photo

#### 7.10.5 TEST RESULTS

EUT Name	Camera E1	Model	CH-C01E
Environmental Conditions	23.7°C/47%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Wang Xinyuan
Test Date	2023-07-31	Sample No.	E20230711057201-0007

For EN 301489-1/EN 301489-17:

Voltage(%Residual)	Duration (Period)	Angle	Required Performance	Actual performance	Result
Voltage dips	0	0 °, 180 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	0	0 °, 180 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	70	25	Criterion C	Criterion A <sup>1)</sup>	PASS
Voltage interruptions	0	250	Criterion C	Criterion B <sup>2)</sup>	PASS

**Note:**<sup>1)</sup> Before test, during test and after test, the EUT working is normal, the EUT function is normal.  
<sup>2)</sup> Before test and after test, the EUT working is normal, the EUT function is normal, the power is shut down during test and it can automatic restores normally.

For EN 55035:

Voltage(%Residual)	Duration (Period)	Angle	Required Performance	Actual performance	Result
Voltage dips	0	0 °, 180 °	Criterion B	Criterion A <sup>1)</sup>	PASS
	70	25	Criterion C	Criterion A <sup>1)</sup>	PASS
Voltage interruptions	0	250	Criterion C	Criterion B <sup>2)</sup>	PASS

**Note:**<sup>1)</sup> Before test, during test and after test, the EUT working is normal, the EUT function is normal.  
<sup>2)</sup> Before test and after test, the EUT working is normal, the EUT function is normal, the power is shut down during test and it can automatic restores normally.

## APPENDIX A. PHOTOGRAPHS OF EUT

Please refer to the attached document E20230711057201-8-EUT Photo.

----- End of Report -----